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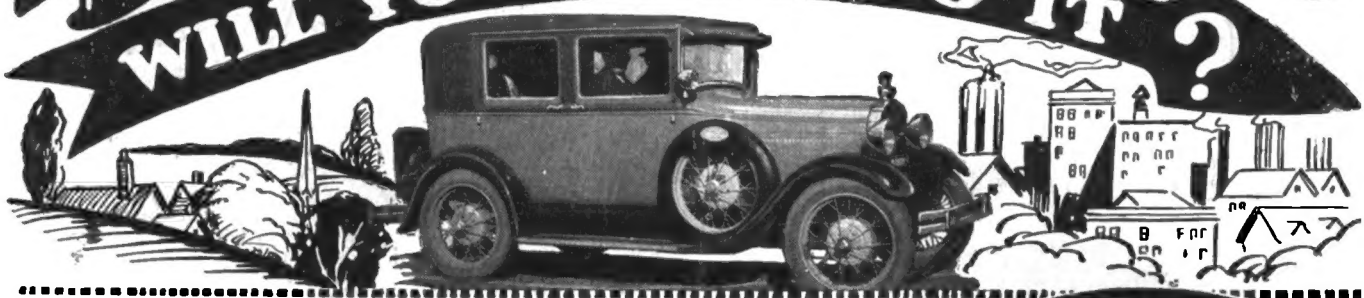

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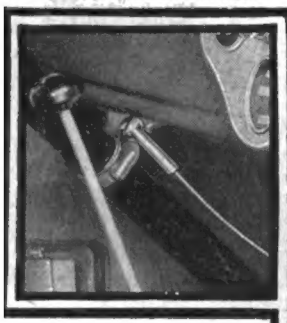

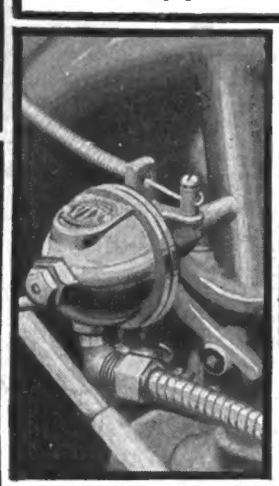

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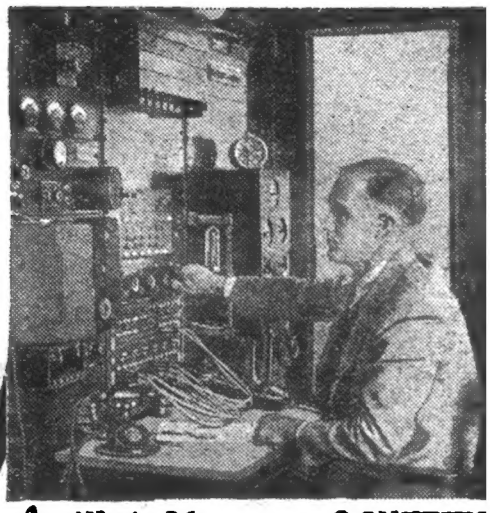

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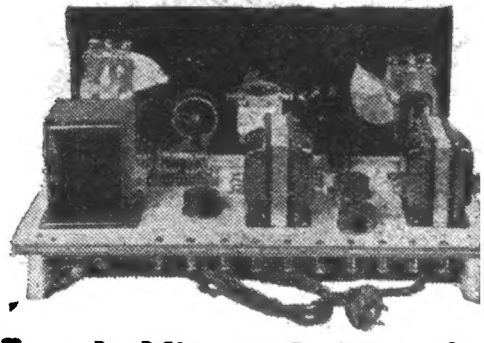

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AMAZING STORIES

Scientific Fiction

Vol. 5 September, 1930 No. 6

In Our Next Issue

THE MAN FROM THE MOON, by Otis Adelbert Kline. Here is a unique story by this well-known author, in which he gives us some highly ingenious new ideas for interstellar warfare and some original explanations for several phenomena which are still a matter of conjecture—albeit absorbing conjecture—among eminent scientists. It is a thoroughly entertaining and thought-provoking bit of scientifiction.

THE MAN WHO SAW THE FUTURE, by Edmond Hamilton. It is more difficult than it would seem at first blush to conjure up even a fantastic picture of the future—if only 50 years hence. So many amazing inventions are brought out in rapid succession today, that it almost seems impossible to think that more things—or things of a more startling nature—can be thought of or discovered. It would seem to have been a simple matter for past generations. Read What Edmond Hamilton finds in this excellent short story.

SKYLARK THREE (A Serial in three parts) Part III, by Edward E. Smith, Ph.D. If Dr. Smith advocates lightning-like velocity for his heroes' travels through space, he does not fall so far behind in his story writing. In this final instalment of "Skylark Three" our author, it seems to us, justifies himself absolutely for keeping us waiting so long for his sequel.

THE DYNASTY OF THE BLUE-BLACK RAYS, by Milton R. Peril. Here is an excellent story of archaeological interest, full of scientific adventure, remaining always plausible.

THE PRINCE OF LIARS, by L. Taylor Hansen. The author of "The Man from Space," and the "Undersea Tube" gives us here a story that is totally different from any other "Newtonian" or Relativist yarn we have ever published. And it is beautifully told.

And other Scientific fiction

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Our Cover

this issue depicts a scene from the story entitled, "The Passing Star," by Isaac R. Nathanson, in which the young scientist and his colleagues watch the last sparms into which the "passing star" throws the world, traveling at enormous velocity as it does.

Illustration by Morey

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Editorial and Executive Offices, 381 Fourth Avenue, New York City.

The Accumulated Wisdom of 4000 Years of Experience by the FAMOUS HINDU ADEPTS

The manuscript from which these Secrets have been compiled came direct from the Island of Ceylon in India. It is now, and always has been in my possession only, and is available from no other source. For convenience it has been divided into twelve parts. ☞ A copy of the first part in typewritten form will be sent FREE to those only who return the coupon at the bottom of this page. ☜

UNIVERSAL ORDER OF OCCULT SCIENCE
Office of Supreme Headquarters
432 Music Arts Studio Building
Los Angeles, California
December 21, 1929

Dear Mr. Haanel:

Having studied several Yoga Courses, I am in a position to state that this is one of the best I have ever read. In fact, I did not know that it was permissible to put some of these things in writing.

I was bound to the strictest secrecy when I was taught some of the things therein contained.

The Yogi teachers would not allow it to be printed, the lessons being given only by word of mouth.

It is a most valuable work and worth many, many times the price to any one wishing to acquire unusual power.

Very sincerely yours,
E. E. THOMAS, Master.
Universal Order of Occult Science.

Chicago, December 18, 1929.

My dear Mr. Haanel:

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Sincerely,
J. AUSTEN CAMPBELL.

These secrets tell of a strange discovery made by the Hindu Scientists—how and why certain methods of breathing make one aggressive, courageous, daring and passionate, while others make one timid, humble, and obedient.

They tell why many attract to themselves evils and misfortunes—others happiness and fortune, still others long life or the reverse. This has in all probability never been heretofore revealed.

They also tell of the many mighty wonder workers in India and the methods by which they levitate their astral bodies or transport them at will to any desired location. Another amazing secret!

They tell where the masculine, fiery and positive etheric forces come from and how they are distributed to all parts of the body; they also tell where the feminine, sympathetic and negative forces come from and how they are distributed.

They tell of the power to create, preserve and destroy.

They tell of that force, which in Symbolical Language is called "The Garden of Eden, the Tree of Life and the Tree of Knowledge," and how the force sometimes leads downward to unrestrained lust and death and how it may be forced upward to supernal heights of power and spirituality. This is another of the Amazing Secrets of the Yogi!

They tell how the ancient Yogis of India have acquired the wisdom by which they can manipulate the invisible forces of Nature and thus seem to work miracles. How they use the mind as an aerial to receive the unspoken thoughts of others.

They tell of the three phases of life or states of Being—of the Infinite, Omnipresent, Manifesting Power of the Universe—of a method of controlling this force. They will tell you of an attractive force which draws power from the Universal storehouse of Power and how by awakening it you may develop miraculous power and become a center of radiant magnetism.

They tell how the Yogis retain buoyant health, rugged strength and charm of personality and postpone old age, decay and death. This is another of the Amazing Secrets of the Yogi and worth hundreds of times the price of the entire course.

They tell of a wonderful secret which was wrested from the Japanese by a Jiu Jitsu champion. The secret is a method of resuscitation, or restoring life to persons who are apparently dead from drowning or sudden concussion of the air, to any stage of collapse or unconsciousness.

They tell of an "inner light." When you are enabled to make use of this "inner light," you not only know, but you know that you know. You are no longer an experimenter, you no longer speculate or guess, you are in touch with the storehouse of power, and can replenish at will. Thus you may turn the tide of failure into success, thus you become a Master!

They tell of a higher plane of existence; on this plane all is perfect. On this plane the harsh lines of the face disappear, the voice becomes soft and beautiful. It is the Ideal state. On this plane the Ideal has become the Reality, the seeker and the sought are one.

These facts have been preserved only in the memory of certain living Yogis, who are the last descendants of a grand array of disciples, who have kept burning the torch of wisdom, kindled by the earliest and greatest ADEPTS OF INDIA.

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In addition to the Hopkins RF amplifying system the 1931 HFL Mastertone incorporates every modern improvement known to science. One dial, one spot, 180 K.C. intermediate amplifier. Resistance coupled, push-pull phonograph amplifier, controlled from panel. Puncture proof, high voltage, humless Electrofarad filter condensers. Self contained, all steel heavily cadmium plated chassis. Doubly shielded radio frequency circuits and dozens of other entirely new features. Our FREE literature gives complete information and prices. *Send for it today!*

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VOLUME 5

AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

SEPTEMBER, 1930
No. 6

T. O'CONOR SLOANE, Ph.D., *Editor*
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Editorial and General Offices: 381 Fourth Avenue, New York, N. Y.

Extravagant Fiction Today . . . . . Cold Fact Tomorrow

The Atom and the Stars

By T. O'Conor Sloane, Ph.D.

WHEN the planetary atom was generally accepted by scientists not many months ago, and when it fitted so well into chemistry, it seemed that quite a pleasant condition of things had been reached. To each atom was assigned a definite number of charges of positive and of negative electricity and out of these charges the atom was said to be built up. In chemistry, we had ninety-two elements to be accounted for, of which today nearly all are known. The weight of the atom was supposed to be almost entirely in the protons or in the charges of positive electricity, and these protons were grouped together in the middle of the atom to form what was called the nucleus. Therefore, if one element had an atom four times as heavy as another, it would be assigned four times as many protons in its nucleus. The electrons were in two classes; the nuclear electrons which were bound into the nucleus, and the planetary ones which were supposed to rotate around it in definite orbits, each set of orbits defining a sort of orbital shell, which has been jocosely termed the nucleus' crinoline. The number of planetary electrons in the atom indicated the number or numerical position of the element in question. Hydrogen with a single planetary electron, was number one in the scheme of elements; uranium with ninety-two planetary electrons, was number 92, and was assigned a status as the highest possible element numerically speaking and the one of greatest atomic weight.

All this is not at all as abstract as it seems. The relative weight of an atom tells the number of protons in the nucleus. There must be an electron for each proton. The planetary electrons must equal the number designating the numerical position of the atom of the element in question and the rest of the electrons are bound into the nucleus. This in a rough way describes the celebrated Bohr's atom. Everything seemed fixed, but modern science is restless, so the Bohr atom was succeeded by the Schroedinger atom, in which the planetary action of the electrons was rejected. And now we have the Heisenberg atom, in which the electrons are supposed to surround the nucleus as a mist surrounds the moon or other body. This atom is only about two years old and it is impossible to predict what age it will attain—whether it will go to an early grave, or have a long life. Atoms recently have been short lived.

There are two words derived from the same Latin root; one is discreet, which means having good judgment, being sensible, prudent. The other word is discrete; this means divided up into small parts. In all the various modern theories of the atom, the little particle is supposed to consist of definite quantities, each identical, of protons and the same number of electrons. The little quantities are called quanta, so when you hear any one talking about quanta, or the discrete nature of matter, it indicates that atoms are made up of the smallest possible quantities that can exist of positive and negative electricity, each element having its qualities determined by the number of quanta present in it. It is fair to say that quanta or the quantum theory of matter puzzled many at the beginning, but it is quite simple. But we must not confuse ourselves between discrete and discreet.

It is interesting and curious to come down the line from the days of Epicurus, the Greek philosopher, who lived some 2000 years ago, to the present time. The original idea was that there were atoms of wood, of metals, of stone and of everything, and that these atoms could not be broken up. About the time of the French Revolution, the Epicurean theory was definitely refuted and the conception of the molecule made up of atoms was formed. This was a true revolution in chemistry, so that the two revolutions, one in science, and the other in government, came pretty close together. And in the political revolution, the great Lavoisier, who ranks with Priestly as one of the fathers of chemistry, was guillotined, being told that the revolution had no need of chemists. But when Napoleon took hold of things and France was besieged on all sides, there was a terrible need of chemistry, and the great chemist Le Blanc made France independent of the foreign sources of soda-ash by inventing the famous process for making sodium carbonate from the salt of the ocean.

Astronomers encounter the problem of the sustained heat of celestial bodies. The long continued heat of the sun has always been a problem as regards its origin and various theories have been proposed to account for it. But the sun is only one of innumerable stars which radiate heat, and theoretically have done so for millions of years; and in endeavoring to account for the source of their radiation of heat we again come face to face with the atom. One of the late theories is that the atom, which is supposed to contain within its inconceivably minute volume a proportionately enormous quantity of energy, is the source of cosmic radiations. This energy set free by some action or other in the stars is taken as the source of their heat and light. It is a strange thought that action within the inconceivably minute atom multiplied by the inconceivably large number present in the sun and stars is responsible for the glory of the heavens. It is certainly an alliance of the great and the small.

The comfortable old physics which we used to deal in is termed the "classic physics." When it comes to the theoretical explanation of things, it seems sometimes to disappear, but the fact remains that for everyday work its laws still hold. Sometimes, on the theoretical side, it seems as if the second law of thermodynamics is the principal thing that is left of it.

There is something more, though, to be said about the atom. If the energy which is locked up in it could be utilized we would have a source of power, which would supplant coal and water power. Eddington puts it in his picturesque way, when he depicts a great power station, operated by a teacup full of water. Readers may complain of the wild visions exploited in some science stories, where the author seems to deal in absurdities. Such people should read Eddington's latest paper and see if the wildest imaginations of romancers go much beyond it. Think of all the stars, many of them so hot that the sun is cold by comparison, being fed with all their heat from the inconceivably small atom.

The Troglodytes

ALL the possibilities of exploration in the Mammoth Cave in Kentucky have not been exhausted by a long stretch. There are still vast caverns and bottomless pits that have not been entered as yet, for it is dangerous business. In Carlsbad, recently, another cave was discovered that, by its sheer immensity, almost puts the Mammoth Cave to shame. Explorers have already penetrated to a great depth below the surface of the earth, and day after day has disclosed new wonders. But what might still be hidden within the deeper confines is highly problematical and is an excellent subject for writers of scientific fiction. Mr. Barclay has a number of ingenious ideas on this subject himself, and has woven them into an excellent story of scientific importance—all based on sound basic possibilities.

AUTHOR'S NOTE

IN placing this narrative on record I take no responsibility for the observations of the man who related it, for he admitted that both he and his two companions were men of poor education, having no scientific training, although one of them seems to have had some small smattering of science such as "the man in the street" acquires from the Sunday magazine sections of the newspapers and the tid-bits of science to be found in the popular magazines.

Where his observations are not in accord with the theories of scientists, who shall say whether he or the scientists are wrong? For there remains the possibility of unsuspected factors, which, although resulting in phenomena that would warrant the conclusions of science, yet not being considered in their calculations would inevitably lead to a false conclusion.

As these observations are not my own, I positively refuse to become involved in any possible controversy that may arise from their publication, but if it results in correcting theories which may be false, and leading scientific thought into a new and truer channel, then Joe Everett's months of painful experience may not have been in vain.

De Profundis

IT was a hot afternoon in late September, and I was mowing the lawn for what I hoped would be the last time for the season. I stopped to rest for a moment and it was then that I saw him first; he was coming up out of the bushes from the river bank on the other side of the road. It was the manner of his coming that first arrested my attention. He was crawling on hands and knees, then he got erect and came staggering up the road toward me, holding both hands over his eyes. I gave a tentative push on the handle bars of the lawn mower, with the intention of finishing the few swathes that remained, when I saw him stagger more and suddenly fall in the middle of the road.

Drunk or not drunk, I couldn't let him stay there. Some reckless driver might come along and I should never forgive myself if anything serious happened.

I stood the lawn mower against the fence and walked leisurely down the road toward him. Leaning down, I took him by the arm and gave him a shake.

"Here," I said, "this won't do, you know; you can't go to sleep in the middle of the road; you will be run over. Come on, let's go over to the grass at the side; you'll be safe there."

I helped him to his feet and found that he was quite wet; evidently he had been in the river; that should have sobered him up. It was then that I got a good look at him. A man of good physique, but of a sickly pallor, not overly tall, but wearing next to nothing in the way of clothes; a very ragged shirt and a pair of pants, that were covered with mud through scrambling up the river bank, comprised his wardrobe. There was nothing left of the pants below the knees. He was barefooted and had a bushy, matted beard, while his hair hung, wet and straggling, upon his shoulders.

When he was on his feet he made no attempt to move, but stood still with both hands over his eyes.

"Come on, Rip Van Winkle," I said. "Lie down in the shade of the bushes just off the road; you'll be able to sleep it off in safety there."

"Shade!" he said, speaking for the first time. His voice was very husky. "It's more than shade I want. If you could put me in a place where it's quite dark, out of this terrible sunlight, perhaps my eyes would get better and I should be able to see."

I was rather surprised at his voice. It didn't sound as if he were drunk. Still the alcohol that was being peddled these days often affected the optic nerves; many people became quite blind in fact. I relented somewhat.

"Here, come on," I said. "I'll let you stay in my garage for a time."

"Thanks," he replied. "It's good to feel the warmth of sunshine, but it's too dazzlingly bright for my eyes after being in the dark so long."

"You shouldn't have stayed in the dark so long," I said, thinking that I was humoring him. "How long were you in the dark?"

"What date is this?" he asked.

"This is September twenty-six, nineteen twenty-nine."

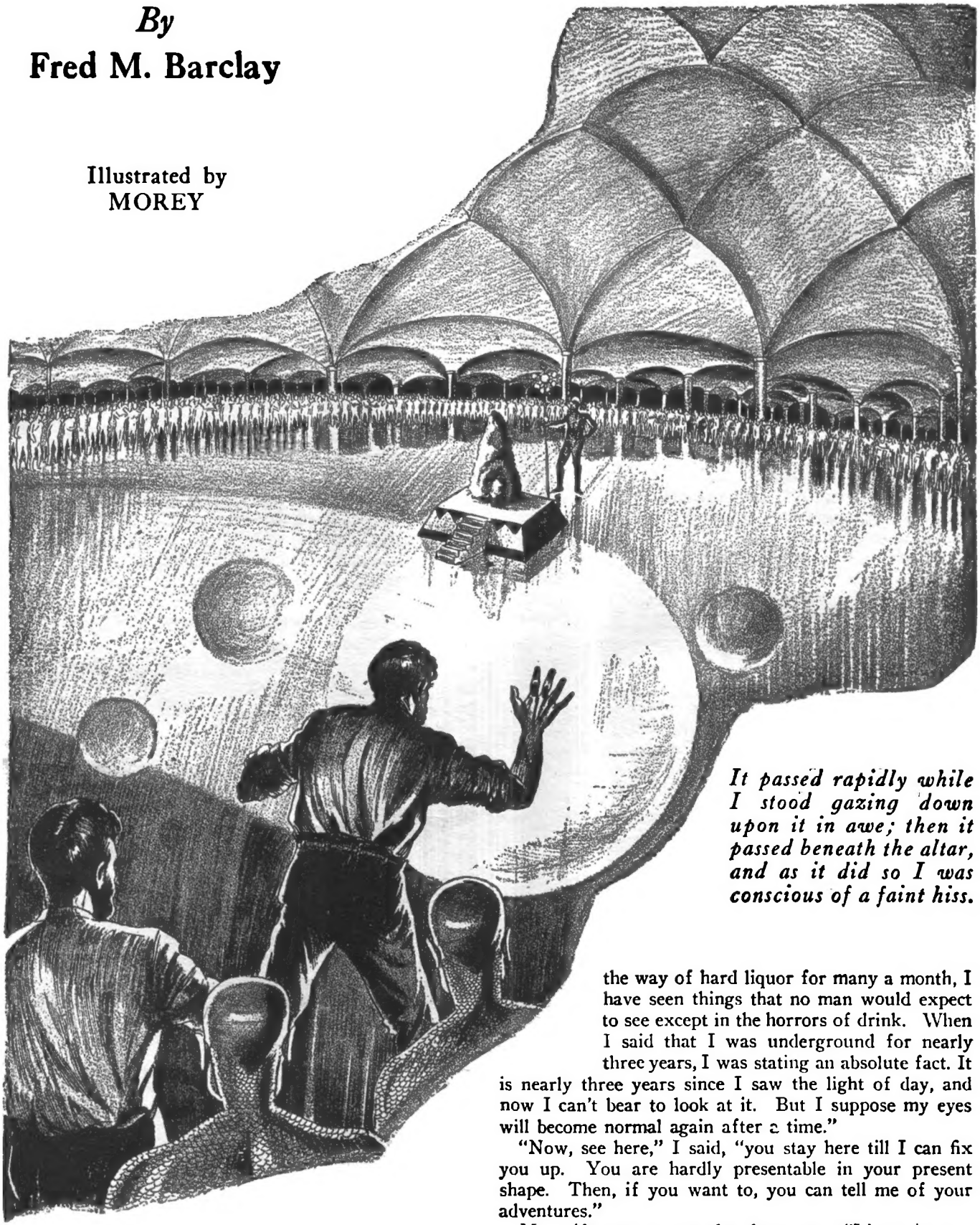
"Then it must be that I was underground among those horrors for nearly three years, for it was in November, nineteen twenty-six, that we discovered the cave."

"Well," I said, "here's the garage; make yourself at home. I'll close the door and I guess I can find something to put over the window."

When I had done that, he very carefully took his hands away from his eyes. It was then I saw how very

By
Fred M. Barclay

Illustrated by
MOREY



It passed rapidly while I stood gazing down upon it in awe; then it passed beneath the altar, and as it did so I was conscious of a faint hiss.

bad they were. Tears were rolling down his cheeks just as they do from the eyes of a person who has very weak eyes. Obviously he was not drunk at all.

"I beg your pardon," I said. "I believe I have been making a mistake about you."

"I believe you have. But, under the circumstances, the mistake was very natural. You thought that I had been drinking. Yet, though I have touched nothing in the way of hard liquor for many a month, I have seen things that no man would expect to see except in the horrors of drink. When I said that I was underground for nearly three years, I was stating an absolute fact. It is nearly three years since I saw the light of day, and now I can't bear to look at it. But I suppose my eyes will become normal again after a time."

"Now, see here," I said, "you stay here till I can fix you up. You are hardly presentable in your present shape. Then, if you want to, you can tell me of your adventures."

My wife met me at the doorway. "Listen to me, William"—when she calls me William I know she's really angry—"you can't let that drunken tramp stay in the garage."

"My dear, you do the poor fellow an injustice. He's not drunk; he's just come through some terrible experience and is almost blind. It's my intention to help the poor fellow. So, if you will get me a bath towel and your shears while I find some clothes, we'll do the best

we can for him. And I wish you'd rush supper along and plenty of it."

An appeal to her sympathies is nearly always successful. So, somewhat mollified, she said, "I wish you'd quit bringing all kinds of tramps here. Before long this place will be like a county poorfarm."

As I was about to leave the house, with my arms full of clothes, she handed me a large towel and the shears and said, "You had better take this along too," whereupon she thrust into my hands a large surgical bandage. "It may be useful for his eyes. Supper will be ready in about half an hour."

The man clapped his hands over his eyes as soon as I opened the door of the garage, although when the door was closed he seemed fairly comfortable in the dim light in which I could hardly find my way about.

He set to work with the razor I had brought and removed the rough beard. Then with the water from the faucet he quickly cleaned up, then dressed himself. While he held the bandage over his eyes I took the covering from the window, then trimmed off the worst of his shaggy hair.

By the time we had finished, my wife was calling, "Supper is ready." So we went across the yard to the house. Although the sun had set, I noticed that he still held the bandage over his eyes but removed it as we entered the dining-room, where my wife had considerately drawn the blinds.

The man ate slowly and with evident relish and at last said, with a sigh of repletion, "That is the first Christian food I have eaten in nearly three years, and I can't begin to tell you how good it feels. It's at such a time as this that a man appreciates good food and especially your good cooking, ma'am."

"Thanks, Mr.—er——" said my wife rather dryly.

"Everett is the name, ma'am; Joe Everett."

"Hamilton is ours," I responded. "Do you smoke, Mr. Everett?"

"That would be the very crown of your kindness, Mr. Hamilton, for I have missed tobacco more than I have missed anything."

I pushed the cigarettes across to him and struck a match, but he covered his eyes again at the flare.

Just then a hearty voice was heard outside. "Hello! what's the matter with the light; trying to economize?"

"Come in, Dad," my wife called, and led the old gentleman into the dining-room. "This is Mr. Everett," she continued. "Mr. Everett has been through some terrible experience underground, and even the smallest amount of light seems to be too much for his eyes, so we were sitting in the dark. I think Mr. Everett was just going to tell us about it."

I don't know whether Mr. Everett had any such intention, but my wife's curiosity was getting the better of her.

"Ah! you're a miner, Mr. Everett?" asked the old gentleman. "An explosion, I suppose?"

"No, sir, I am not a miner; neither was it an explosion that caused the trouble. My eyes cannot bear the light because I have been underground for nearly three years and, for the greater part of that time, in complete darkness."

"Were you alone, Mr. Everett?"

"No, sir, but I wish that I had been, rather than with the things that were there, and to see my two companions horribly destroyed as they were. I scarcely like to tell about it because I know that it will sound incredible.

"I shall not feel hurt if you express your unbelief."

"I have seen some queer things myself in my studies," said the old gentleman.

"Professor Small is a paleontologist," I explained.

"I don't know what that is," said Mr. Everett, "but if it will help him to understand, so much the better. But I'll tell you the story from the beginning.

The Finding of the Cave

"I WORKED a good many miles north of here in the summer of nineteen twenty-six. I was engaged in concrete construction. Working with me were two other men, very close friends of mine, John Bowers and Jim House. That line of business is limited to the summer months, so the pay is very high during the season. Toward the middle of September we began to discuss what we should do during the winter months. We were all agreed that it would be rather nice to spend the winter in the South, but railroad fares eat into one's savings so badly that it did not seem quite feasible.

"One day John Bowers suggested that we pool our money and build a cabin boat in which to go down the river. About the beginning of October we began to have lay-off days on account of frost, for even October cold was too much for concrete, so we decided to quit the job and start work on the boat. Being good mechanics, it did not take us long to build a boat that was large enough to accommodate three men very comfortably.

"We came down the river very leisurely, for we knew that we were well ahead of the freeze-up; between fishing and hunting and playing cards in the evenings, we had a very enjoyable time. Sometimes we would lay over near a river town; get in fresh supplies; go to a show; buy a few books and magazines, then drift on again. We hadn't a care in the world.

"One evening we tied up under some tall bluffs—they can't be very far up river from here, because I came out of the same hole today and floated down on the current this far. I noticed, as we came along, a place where a stream of clear, sparkling water came out of a hole under the bluffs. Now the river water, as you know, is not very good unless it is filtered. So when we had tied up, I went back along the shore with a couple of buckets to get some water from the spring. When I got there, I found that one could crawl in a considerable distance under the bluffs, which I did, but had to stop when I got beyond where the light penetrated. I told the other fellows about it on my return with the water and John Bowers said, 'All right, boys, since we have nothing to do but kill time, let's explore that cave in the morning. Maybe we'll find something interesting.'"

"Excuse me," interrupted Professor Small, "what was the name of your boat?"

"*The Three Jays* was what we called it, sir, and the name was painted on the bow. You see, poor Jim House was something of a joker, and one day he said, 'We'll name this boat very appropriately for our initials —*The Three Jays*—it fits exactly, for if there ever was a jay trick, it's this one of starting in a Noah's Ark outfit like this.'"

"Ah!" said the professor, "that's one item of circumstantial evidence, whatever your story is, for your boat, *The Three Jays,* is lying down at the lower edge of town now. It was only yesterday that I was wondering what mystery was connected with it. You will remember,

William," he said, turning to me, "that in the early part of the winter of twenty-six the river froze over rather early and then the ice broke up again. In the run of ice his boat was brought down and pushed well up on shore at the bend just below town. No one ever claimed it, so the marshal took charge of it. That must be the boat in which Mr. Everett and his friends came down the river. But please go on, Mr. Everett."

"The next morning we started out, each carrying an electric flashlight. We crawled into the hole for some distance; then as the roof got higher, we were able to walk. We continued on for a long distance, the cave spreading out all the way, until we came to a blank wall of rock. The little stream was on our left, but at that point it came out of a small hole that was not much larger than enough to carry its volume of water.

"John Bowers picked up a loose rock and began knocking on the wall. 'Sounds hollow,' he said. Then he noticed a hole in the wall, not much larger than a man could get his head through. He pushed his flashlight through and looked in. 'That's some cave,' he said. We all looked in and I think I had never seen a cave anywhere larger than that one. We tried to pull some of the rocks away so that we could get in, but having only our bare hands to work with, we had to give it up.

"'Seeing that we have all the time in the world,' said John, 'I think we might find out how big that cave is.'

"We returned to our boat and, taking our skiff, pulled up the river to a small town we had passed the day before. There we bought some dynamite and candles and, seeing a box of chalk such as is used in schools, John bought that as well. 'For,' he said, 'there's no knowing how many passages and tunnels there may be in there, and we don't want to get lost. So we'll put a mark on the rocks wherever we make a turn.'

"We returned to the cave and, setting the dynamite to the best advantage with a long fuse, we dashed out to the boat and pulled out on the river. We had not long to wait before we heard the explosion. Then, while the gas was clearing away, we returned to the cabin boat and prepared for the expedition. We put up a package of lunch at John's suggestion. He seemed to have more forethought than we other two, and, although he was a much older man he was just as keen as Jim and I for anything like adventure.

"'There's no knowing how far we may be able to go underground,' he said, 'and I don't want to have to come back before we get to the end just because we haven't got something that we didn't think of.'

"Jim suggested that we carry our guns—we each had a shotgun for hunting—but John said that he thought they would be rather in the way. He did agree, however, that I should carry a thirty-eight caliber revolver which I had, as there might be a few bad snakes. That was the only thing he expected to encounter. How far out he was in his guess you shall soon hear.

"WE found that the dynamite had done a very satisfactory job, so that we were able to scramble over the loose rocks, directly into the big cave, without further trouble. We each carried candles; as the light from those was rather feeble, we also carried our electric flashlights. With these we were able to throw powerful beams of light around the cave. It was immense. The roof was at least thirty to forty feet above our heads where we stood, and our powerful lights seemed only just to penetrate to the walls on either side. There was a constant drip of water from the roof, from which depended long, slender, cone-shaped points of rock, and the floor was very rough. In one or two places there were pillars of rock that seemed to be helping to support the roof; they were slender in the middle but spread out where they joined the floor and roof. John said that they were stalactites and stalagmites that had become united and gave us a short account of their formation. You see, he had spent a good many of his winters around the public libraries, so that he was much better informed than we were.

"There were quite a number of snakes twined in bunches on the ledges of the walls—just the common sorts that we were used to—but being so near winter, they seemed to be half torpid, so that we had no trouble with them. Our lights disturbed quite a number of bats, which swung about in a panicky manner near the roof. We went forward to the far end of the cave. There the roof dipped down and the walls drew inward until we were in a place where the roof was not more than ten feet above our heads and the walls not more than six feet apart. There did not seem to be much of interest, except the tremendous size of the cave.

"The small tunnel-like opening seemed to contract more further on, but as we could not see the end John was all for going on. Here the floor dipped downward at a sharp angle. We came presently to another wall of rock, but saw that there were tunnels leading off to each side. We tossed up a coin to decide which we should take, and then John placed the first of his chalk marks—an arrow—and called our attention to the way he was placing them, always to the right hand and pointing to the way we came in. I am glad that he made that definite system, because it saved me many precious minutes later. And upon those minutes my life depended.

"We went on through tunnel after tunnel and cave after cave, some large, some small, until I was beginning to feel rather tired. All the way we had been going steeply downhill, but there did not seem to be anything of interest. We had used up quite a number of candles when, as we were going through an extra long tunnel, Jim looked at his watch and exclaimed, 'Do you fellows realize how long we have been down here? It's just six hours since we left daylight.'

"'I didn't think it was so long as that,' said John. 'We'll go on to the next cave, and if we see nothing more interesting than we have seen, we'll eat lunch and return.'

"But the next cave was not the last that we saw that day. When we entered it and turned on our torches, we met a sight that nearly dazzled us. There were pillars and stalactites and stalagmites and beautiful fretted designs along the walls and roof, all of some crystalline formation, that flashed back our lights at us in a myriad of colors. There seemed to be lights flashing from the recesses where the lights of our torches did not penetrate. It was a perfect wonderland of rainbow hues. Jim thought that we had entered a cave of diamonds and that our fortunes were made, but John told him that it was not diamond, that the rocks were of some sort of crystal that grows with natural smooth facets, which, being superimposed on one another, reflected our lights in many colors.

"We ate our lunch in that cave and tried to estimate the distance we had come. John thought that we were at least five or six miles from where we had entered and from two to three miles below the surface—deeper, he suggested, than any man had been before, and wished

that we had some means of making a true estimate. It was quite hot there, so that we had long since taken off our coats. I was about to throw away the remains of my lunch, for we had brought along twice as much as we needed, when John stopped me.

"'Better keep it, Joe,' he said, 'we may need it before we get back, for now that we have got to where there is something worth seeing, I propose that we go on further. Time means nothing to us, now that we are not working.'

"The crystalline formation seemed to predominate in the next two or three caves. We continued to descend at a steep gradient. Presently we came to a cave where there was a vegetable growth. In form it was not unlike rhubarb: a thick, juicy stem, with a single large leaf at the top. It was all of six feet in height, but it had no color, unless you could call a dirty light gray a color. We heard the scurrying of some small animal among the thick stems and there was a smell of decayed vegetation, while the atmosphere was more humid than in any of the caves we had passed through except those near the surface.

"For several caves these growths continued. Then we came to something that was different; it looked like celery, both the stems and the leaves being almost white. Again there was a change in the vegetation. We came into a cave where there was nothing but fungoid growth of a pallid color, slightly tinged with yellow. I was very much surprised to find anything in the nature of vegetation so far underground, but Jim said that it did not surprise him very much, for he had heard of such things as mushrooms and rhubarb being cultivated in coal mines and there were possibly other things that could be made to grow under similar conditions.

Fight in the Dark

"JOHN was just remarking that these things seemed to grow as if they had been cultivated, for they were in regular rows, and each cave seemed to be relegated to one sort of plant life, while the soil had the appearance of being tilled. Suddenly Jim stopped and said in a husky whisper, 'Listen!' We stopped. Then we heard it—a sort of rustling, clicking sound. It seemed to be behind us. I turned quickly, snatched my torch from my belt and switched it on in one motion. There, in the direction from which we had come, were two points of greenish light; below them was a pale pinkish sheen. I snatched out my gun and fired, but the thing had disappeared in a niche. The only effect that the shot seemed to have was to send echoes roaring through the caverns and to bring down a number of stalactites from the roof. Fortunately, none of them struck us. We started running toward the spot where the thing had disappeared, John advising me to be more careful with the gun, as we might do ourselves more harm than good.

"Again we heard that clicking, rustling noise following us. We turned quickly with our torches, and there they were, at least a dozen of the queerest beings that anyone has ever seen. As the light of our torches struck them, they covered their eyes with their hands, and, in a crouching attitude, turned their backs upon us and ran. Jim was facing the other way when he called out, 'Look out! there's another bunch of them coming from this side.' Then there came a sound like a light puff-f-f, and all our lights went out together. We three were standing back to back when I saw those luminous, greenish spots approaching us again. As I pulled the trigger, John called 'Look out!' as we heard an ominous cracking above us. We each leaped forward instinctively in the direction that each was facing, which drew us all apart; a stalactite fell from the roof directly on the spot where we had been standing; then they were upon us in the darkness. We fought, I with the butt of the revolver for a time, until it was knocked out of my hand; then with my fists, striking out in all directions in the darkness. Sometimes there was nothing there and my arm would feel as if it were dislocated; then again I would land on something hard, yet yielding. But every time I landed I could feel that my knuckles were being skinned by something sharp. At last they swarmed upon me and pulled me down. I could hear the sound of a struggle going on to one side of me for some time and then came silence. I think Jim was the last to be overpowered. Then I heard John's voice at some distance. 'Oh, Joe—Jim! they've got me. Are you all right?'

"'They've got me too, John,' I called, 'otherwise I'm all right.'

"Then we heard Jim's voice and there was a lilt in it as if he had had a good deal of enjoyment. 'I guess they've got the bunch of us,' he called, 'but some of them will know they've been in a scrap. What the dickens are they, John?'"

* * *

Here Mrs. Hamilton's curiosity got the better of her, for she asked with a quiver of excitement in her voice, "But what did they look like, Mr. Everett?"

"Now, ma'am, this is one of the things that no one will want to believe."

Professor Small leaned forward very intently as if he did not want to miss a word.

"They were men and women, yet they were unlike anything in the shape of men and women that I had ever heard of. They were tall, taller than the average, and their bodies were very large, both broad and long, while their legs were short. They carried themselves in a slightly stooping attitude, although their heads were erect. Their arms seemed to be of a proper proportion and well developed. But they were covered from head to foot with scales—scales like a fish or a snake—if you can imagine a person covered with finger-nails, overlapping one another in regular rows, you will get a fair idea. But these scales were hard and horny, of a pinkish tint, just like a good healthy finger-nail should be. It was these scales that were cutting our hands to pieces while we were fighting them. Their faces were not bad to look at, more or less like the average human face, except that their lower jaws jutted out rather far, something like the jaws of the big apes that I have seen in shows."

"Prognathous!" muttered the Professor.

"But their noses were not like those of apes—short and wide. Some of them were straight and some were more of the Roman type. Their mouths were well shaped, although, on account of the jutting lower jaw, rather far forward; their eyes were unusually large and round and their foreheads were straight and high, not sloping as you would expect from the shape of the jaws. Their faces were bare of scales and the skin was smooth and very white, as were the undersides of their arms and the palms of their hands. There was no hair upon their heads, but a sort of bony or shell-like cap, which ended in a thick upward curved roll at the base of the skull and on the forehead a slight protuberance like an embryo horn. We thought at first that it was some sort of cap or helmet that they were wearing, but discovered

later that it was a natural growth of a light brown horny substance. Of course we didn't notice all of this at the time of our first encounter, but we had plenty of opportunity later.

"They dragged us to our feet. Then the three groups drew together, holding us in as prisoners. For a time they conferred in a language of which we could not understand a word; then taking us by our arms, they moved off in the darkness. They could see as well in the dark as we could in the light. All that we could see was the luminous gleam of their eyes, as first one then another turned toward us.

"Jim and I seemed naturally to turn to John for advice. We asked what he thought of our situation, but he said that it was of no use to speculate, for this was quite wide of all previous experience. He thought that our captors were intelligent and in some sort human; he didn't think they intended us any harm, judging by the careful way they had handled us, for even in the fight they seemed to be careful not to hurt us. He advised us not to resist them any more until we saw that they intended to harm us, for they might possibly turn us loose after they had satisfied their curiosity, for they were evidently as curious about us as we were about them. 'Anyway, whatever happens,' he said, 'it's all in a lifetime.' After which philosophic remark we marched on in the midst of our captors in silence.

"After a time they stopped, and I knew by the lift on my arms that I was to step up. Then came a gentle pressure on my shoulders when I sat down with one of my captors on each side of me. In a moment I felt motion and knew that I was on some sort of machine; it gathered speed rapidly and, judging by the way the air rushed past us, and later when we went through a place where there was a slight luminosity in the walls, the pace must have been tremendous.

"We seemed to have been an hour or two on that machine—time enough, with the pace we were going, I thought, to have got half way round the world—but there were times when I got the sensation of falling, such as one gets in a rapidly descending elevator. Our course was far from straight, for I had felt the sway of the machine as we made turns at tremendous speed, first to one side then the other, and I think I should have been thrown off many times if my captors had not held on to me.

Home of the Ampu

At last the car slowed up and stopped in a very large vaulted cavern where there was a slight luminous glow that was not any stronger than a clear, starlight, moonless night. In fact, it had much of that quality, but even in that dim light we could see that the pupils of our attendants' eyes were contracted to mere slits, although the light did not seem to bother them as had the lights of our candles, to say nothing of the light of our electric torches. Our own eyes were becoming accustomed to the dim light, so that we were able to see what was going on around us fairly well.

"They swarmed about us in hundreds, a rather apathetic crowd, I thought, of young and old together. It was the first time I was ever exhibited as a natural curiosity, and Jim, the irresponsible, at once began a facetious circus ballyhoo which made John laugh outright in spite of our predicament. But there was no sympathetic response from the crowd.

"It was a weird feeling to be standing there in that dim light with those innumerable, gleaming eyes staring at us and see the glistening sheen of their bodies as they moved about, but it was some satisfaction to feel, as they came in contact with us, that there was a natural warmth in their bodies. Had they been cold or clammy, I think horror would have taken possession of us.

"Their languid curiosity soon evaporated, so that they dispersed and went about whatever duties they had, leaving us very much alone. It was not until Jim said, 'I wonder if they are going to give us any eats,' that John and I felt the pangs of hunger.

"'Let's try to get something, anyway,' said John. But how to go about it we did not know. Then an idea occurred to him; he drew a piece of chalk from his pocket, and catching one of our captors by the arm, drew him over to a blank wall space and commenced drawing the picture of a man which, although rather crude, was good enough to represent one of us. Opposite that he drew a representation of one of our captors—imitating the scales and the curious headpiece rather well—presenting a large dish to the human figure. There was a representation of smoke or steam issuing from the dish. The creature looked at the picture for a moment, then nodded his head as if in comprehension. He said something to some of the others, who immediately departed and soon returned with steaming dishes of food.

"'Got it the first time,' said Jim. 'That guy must be a scientist; guard that lump of chalk with your life, John.'

"'At any rate, they understand art,' said John with a smug grin.

"There was a very dark-looking piece of meat in the dish about which we were very doubtful. However, we could not afford to be too squeamish. Then, in a pasty substance we got the flavor of boiled chestnuts, and that was the best we got to eat all the time we were there. The other things were more or less insipid, but they were edible and would stave off the pangs of hunger.

"After we had eaten, we saw that everyone was climbing into horizontal niches in the rocky walls. Presently the person who had procured our supper came over and, taking John by the arm, led him to one of the hollow places and indicated that he should enter. This person seemed to take charge of us from that time on. He must have been proud of the fact that he had been the first to communicate with us intelligently.

"'Sleeping compartment!' said John, and we saw that there was ample room for the three of us and that the floor of the niche was covered deeply with some sort of fabric, the first that we had seen. Clothing was quite unnecessary in that warm climate. Jim took the fabric between his finger and thumb to find out what it was. 'If that isn't silk,' he remarked, 'I've never worn a silk shirt in my life; but it's the thickest I've ever encountered.'

"Although we were very tired, we lay there discussing our position for some time until the dim light faded and thick, black darkness ensued. John's last remark, just before I dropped off into deep sleep, was: 'It's no use to think of getting back unless they are willing to take us, for, judging by the length of time it took and the speed with which we came, we are probably four or five hundred miles from the river and at least half of that is straight down. We may as well see all we can about these queer creatures, so long as they treat us decently, and then we will find means and opportunity for getting back.'

"When we woke we found that the dim light was shining again and our friend, the provider of supper, was waiting for us. He beckoned us toward an archway that led into a cave at right angles to the one we were in. Others were going in there, but as they entered they paused and, looking up, brought both hands above their heads, then slowly lowered them to their sides in the form of a complete circle, following that with a very low and, apparently, reverent bow. Looking up to the center of the arch, we saw a strange figure. There were eight slightly luminous balls revolving on two different orbits, four to each orbit, the orbits crossing each other at top and bottom, but equi-distant at their equators. The strangest part of it was that the thing hung there in a position opposite to the central point of the arch, but without visible support. In fact, so far as I could see, a tangible support would have been impossible to have allowed freedom for the revolution of its two orbits, which were at right angles to each other.

"As we approached, John said, 'Whatever that thing is, they think an awful lot of it, and we'd better do the same as they are doing.' Turning to Jim, he said, 'And for heaven's sake, take that grin off your face, Jim. This is serious business, and we don't want to offend them by any appearance of levity.'

"Our guide seemed pleased when he saw us make the salute and then took us over to a raised stone table-like arrangement on which were several dishes of raw food. We saw that each different sort of food was on a different kind of metal platter, and behind the table was a moving belt containing a number of dishes. As we took what looked best to us, there immediately slid from the belt a similar platter, containing the same sort of food, into the place which we had made vacant. We were curious enough to watch the machine while others came and took what they needed, but the machine never made a mistake. Always the same sort of platter, containing the same sort of food, in the same place. Yet there were a variety of platters passing on the belt. 'Must be selective magnetism,' suggested John.

"'It's a nifty idea for a cafeteria,' said Jim.

"There were quite a number of the creatures in this cave, engaged in preparing the food. Our guide began to show us the process, when one of the females came forward to help. When she had performed some mixing process with the food, she opened a door which we found was some sort of oven, and although there was no light visible, there was plenty of heat. These ovens were ranged all along the walls; hundreds of them, and as the food did not seem to take long to cook, there seemed to be no waiting. We sat down to long stone tables to eat and afterwards, under the direction of our guide, we put the empty dishes into a chute, down which they immediately disappeared."

"That's the sort of housekeeping I'd like," Mrs. Hamilton remarked.

"Yes, ma'am, that's what we thought at first, but we changed our views later."

The Examination

"OUR guide soon led us back to the cavern where we had slept and from there to another, larger than any we had as yet seen. We walked to the far end, which was a long distance, but everybody seemed to be drifting that way.

"At the far end we saw a raised platform, and presently out of a tunnel glided a machine upon which were sitting several of the creatures, male and female. Most of them seemed to be very old, for they moved feebly. They took seats on the platform and then everybody looked expectantly at us, and a passage was formed between them directly to the platform. Our guide moved forward and looked at us as if he expected us to follow, but when we hesitated we were quickly passed from hand to hand—with apparently little effort—and we soon found ourselves on the platform.

"In a moment they were stripping us of our clothes. Jim and I were for resisting, but John advised us not to 'because,' he said, 'it can't matter, for no one else is wearing clothes.' Jim did resist a little, but in a moment he was so helpless that his clothes were taken off him without damage except to his dignity.

"There were a few exclamations from the crowd when they saw our scaleless skins. But these were immediately silenced when three of the people on the platform stepped forward, each with an instrument of three tubes, arranged with a large one above and two smaller ones below. With these set to their eyes, they began a very minute examination, going over every part of us carefully. 'Some sort of X-ray,' I heard John mutter, while Jim called to us, 'What do they think this is, Ellis Island? I'll tell the world I'm a better American than any of them.'

"There were three people on the platform who were evidently stenographers, for each had a thin sheet of metal upon which he seemed to be writing with what John called an electric stylus. Very small sparks flew from the contact with the metal, so that each of them was wearing a pair of dark goggles to protect his eyes.

"The one in the middle, who was examining John, now and again would confer with the others who were examining Jim and me and then would turn to the crowd and address them. Whether what he said was very technical or not, the crowd seemed to understand and the stenographers wrote it down.

"Our clothes meanwhile were passing from hand to hand all through that great company. Our eyes seemed to be a point of great interest, for they examined them several times. They seemed to be rather interested in our lungs also. John thought that the difference of atmospheric pressure between the surface of the earth and this deep place had developed a greater lung capacity in us than in them. In fact, the difference of pressure had been quite noticeable, for each of us had complained of a singing in our ears, and there was a swollen feeling about our heads, although we had found no greater difficulty in breathing. Our hair was another item for special attention, especially Jim's, which was red. They lifted our legs and bent our arms, flexing our muscles just as if they were judges at a horse show.

"At last the examination was over. Our clothes were returned to us and, while we were dressing, those on the platform were conferring with one another. At last a male and female, who seemed to be the oldest and to have authority, with a wave of their hands dismissed us at the same time saying something to our self-selected guide.

"We commenced our return to what I might call the home cave, our guide walking as if he had business to attend to, although the crowd lingered and seemed to be discussing us.

"Arrived near where we slept, our guide went to a

blank wall space and there made motions with his finger as if he were drawing. Then he held out his hand to John. John at once produced a piece of chalk. Our guide made a rough sketch, first of one of his own people, and then pronounced the word 'Ampu.' We repeated it. 'Great!' said John. 'He's going to teach us the language.'

"'Hold on, old top,' said Jim, 'introductions are in order.' Pointing to John with an elaborate bow, he spoke his name, which was repeated. He did the same with me, and then he introduced himself. Our guide seemed to catch his intention at once, for he repeated the names distinctly, then introduced himself as Labvo.

"He made rapid, rough sketches of many objects, giving the name and waiting each time till each of us had pronounced the word correctly, whereupon he rubbed out that sketch and produced another.

"Days—if I may so call them—passed rapidly in this way. (We found that the dim illumination, by our watches, was about sixteen hours, while the period of complete darkness, during which we slept, was about eight hours, so that the day of twenty-four hours corresponded fairly well with our own. At last we had an imperfect but at least working knowledge of the language.

"Then one day Labvo came to us in a timid manner, which was not usual for him, and placed in John's hand a rod of about four feet in length. John examined it and found that it was an electric torch similar to those we had lost, except for its length. As soon as Labvo saw that John recognized it for what it was, he told John that these things were very harmful to the Ampu, their eyes not being accustomed to so strong a light, but the council had realized that, owing to the difference in the structure of our eyes, we could not see very well without them, so they had made them. John at once assured him that we would be very careful how we used them.

"When Labvo saw that we understood, he handed one each to Jim and me. We lost no time in getting to the darker corner of our sleeping alcove and testing them, to find that they threw a splendid light. We spent some time in literally gloating over this splendid gift, for up to now we had seen very little except in a groping way.

"Then Jim began to whisper and, although no one knew a word of our language, whispering seemed to be in order as with all conspirators, for he was at once suggesting a plan for our escape. 'With these torches,' said he, 'we can grab one of their cars, after we learn the trick of operating it, and by directing the light toward anyone who chases us we can keep them from recapturing us.'

"'Nothing doing,' said John emphatically. 'I have already given my parole in regard to these things, and I would not for one moment think of betraying their generous confidence; besides, how far do you think we would get with them? You seem to forget that the torches we brought with us were put out of commission by some invisible, neutralizing ray when we fought them up above. Another thing, what hope would we have of finding our way through probably hundreds of miles of labyrinthine caves and tunnels without a guide? I prefer to take my chances among the Ampu.'

"Labvo came to us again and told us that he wished us to go with him. He led us out to the end of the cave and in a moment we were seated in one of the swift cars in which we had arrived. A short trip in the dark, then we alighted to enter another cave which was slightly better illuminated than the home cave. From the wall he began to pull out some metal frames that were filled with thin metal leaves. The leaves were strung on rods in the frames, so that there was space to push them along and see between them. We found that each metal leaf was engraved with strange characters. We brought our new lights into play, while Labvo protected his eyes with goggles, but we could make nothing of them.

"He informed us that these were the records of the Ampu, but he had overlooked the fact that these characters meant nothing to us. They were the strangest books I have ever seen and the most permanent. The walls of the cave were full of them. The Ampu must have had a great history.

"Labvo took us back, greatly disappointed, and left us for that day. The next day he took us back to the hall, or cave, where we were first examined, and there we met the same Ampu again who had conducted the examination. Labvo made a report to them of our progress. They seemed to be as much disappointed as Labvo when they found that we could not read their books. They held a short conference, and Labvo, who was one of the most active of the Ampu, seemed delighted at the result.

"Back in our living quarters again, we were left to our own devices, and we had a better opportunity to look around. We speculated upon the use or significance of the eight balls swinging eternally on their two orbits, but could make nothing of it. The Ampu referred to it as *Octram-ka-listrol,* which literally means the gods of the center, but they resolutely refused to discuss it with us. Considering their reverence for it, we always made the salute when we passed beneath it.

"As there were no Ampu about in the cavern at this time, we made liberal use of our torches and noticed for the first time some strange bird-like creatures that perched high up on the ledges of the cave. Sometimes they flew down to the floor and strutted about like barnyard fowls. They were without plumage of any sort, but seemed to be covered with a dark leather-like skin. At times they would be disturbed by strange scale-covered creatures about the size of a fox. At such times they would fly up, with horrid screams, to their resting places above. John thought that they were probably diminutive descendants of the ancient pterodactyl. They were about the size of a goose, but had a much larger bill and longer legs. There were some lizard forms and some harmless snakes; all seemed perfectly domesticated. Jim wondered which of them provided the meat which we ate at our meals, but said that it didn't matter much, since there could be no preference, judging from externals.

An Archæological Excursion

"LABVO returned to us shortly after, and we saw that he was equipped for something unusual. Over his shoulder he carried a bag made of the same sort of silky fabric as that on which we slept; we found later that it was filled with food. Hanging at his side was a pouch-like affair, that was suspended from his other shoulder by a cord, in which was stuck a large knife; hanging upon his chest from a small chain, which encircled his neck, was a cone-shaped object about the size of the palm of the hand; later we knew what it was—when we realized the futility of Jim's plans for escape.

"With Labvo were three other young Ampu, two females and a male. All were equipped as was Labvo. Quite obviously they prepared for quite an expedition.

"Labvo invited us to accompany them. When we arrived at the car, which we had learned to call a 'lofet,' Jim manifested a little excitement. 'See here, old man,' he said to Labvo, 'not too much speeding; give us a chance to view the scenery,' quite forgetting that Labvo knew not a word of English. I am afraid he had found our period of education and inaction more monotonous than had John and I.

"Labvo and the others seemed amused when John explained that we should like to stop to see whatever there might be of interest on the way.

"Presently Labvo stopped the lofet. We had not been long in traveling, but we must have covered a tremendous distance. Labvo told the other Ampus to put on their goggles, and then asked John for his torch. It was then we discovered something new about the torches. By turning a knob at the end, we could get anything from a soft twilight effect to that of a powerful search light. Here was something new in electrical torches. Although they never saw one before they examined our broken ones, they had certainly improved on them!

"My comrades and I involuntarily started back when the light was on. The cave before us was full of spiders —standing still and staring at the light of the torches. Never had I seen such enormous spiders. Jim said these were about six times as large as the tarantulas he had seen in the South.

"Labvo assured us, however, that they were perfectly harmless, because, he told us, in the course of many generations they had improved these spiders by selection and trained them to be useful to Ampu.

"Another Ampu now appeared from the side of the cave and began to whistle softly, whereupon the spiders settled down to their business. We now saw that they were working on metal frames, and were not only spinning a thread but were actually weaving it into the thick, soft fabric with which we were already familiar. The Ampu, whom Labvo called Pulebsus, was the superintendent of the spiders; he had several assistants who feed and care for the spiders, and occasionally trained a fresh generation to produce new and intricate weaves.

"After we had started in the lofet again, Labvo slowed down a little to talk to his fellow Ampu. We couldn't quite catch the drift of their conversation, although there were several references to something called ambala. They all agreed to whatever his suggestion was, and laughed in a quiet way at what seemed to be a good joke. This surprised us not a little, for it was the first evidence they had given of any emotion.

"When the lofet stopped again they left everything on it except their knives. Of course, we carried our torches. We walked for some distance this time, and when the Ampu had preceded us, Labvo gave us permission to put on a dim light in one of the torches so as to aid us in our walk.

"When we arrived at the entrance to another cave, we saw that there were two metal cars across, one above the other. At the ends of these, the Ampu turned knobs and then beckoned us to approach. Inside the cave the vegetable growths were all mixed up like a jungle, which seemed strange after the orderly growths we had seen before, each kind confined to a separate cave. They told us to wait there and then they disappeared. We could hear them laughing quietly among themselves as if in anticipation of some joke. Presently we heard a tremendous roaring, which sounded hollow and awful as it reverberated in those great caverns, and then a thud, thud, thud as of heavy shuffling feet coming from the far side of the cave. We were ready to run, but Jim said, 'I guess this is the joke coming,' so we stood our ground. By the dim light of our torches we saw a dark shape appear at the far side, through a tunnel; I rapidly turned the knob of my torch to get a better view. The thing was about five feet in height but had a tremendously long and thick body, not unlike a rhinocerous with short and very thick legs. It stopped as the light struck it, and its eyes gleamed red; its mouth opened, showing great teeth, while along its spine, and around its neck, like a ruff, it erected a fin-like arrangement, which seemed to clash as it raised and lowered it rapidly. It let loose a terrifying roar, and indeed it was a fearsome spectacle. We were certainly ready to run now, although the thing had hesitated when our light struck it. Then we heard the voices of our friends from behind it. 'Turn down your light, it is too much for us,' and they were actually pushing the thing into the cave and prodding it with their knives to make it advance. Suddenly it jumped free from them and after cavorting clumsily a few times, it turned and fled, bellowing, through the caverns.

"Our friends found difficulty in controlling their laughter, but one of the women who was called Ishtu, said, 'Men are brave like Ampu.' Then they laughed uncontrollably again, so we knew that the remark was an extension of the joke, for we were undoubtedly pale and shaken.

"They explained to us, after their merriment had subsided, that the ambala was a very timid animal, and that despite its terrifying appearance, it made excellent eating.

"Jim, who was never very good at taking a joke against himself, remarked in an aside, 'Not much improvement on the other critters.'

"When Labvo turned the knobs at the ends of the bars again, he explained that the bars were charged with a heavy current, and warned us to be always careful, as they had to keep the ambala and some other creatures within bounds; otherwise they damaged the crops.

"'Rhubarb, celery and toadstools,' Jim remarked sarcastically.

"I was glad that our friends could not understand him for he was getting into a bad way, developing a grouch that later became almost murderous, so that we had difficulty in concealing it from the Ampu, who were really treating us extraordinarily well, considering the circumstances.

"We knew that we were well into the upper caverns before we reached our destination. The knowledge that we were so near the upper world affected Jim badly. He was all for making an attempt to get away, no matter at what cost to the four friendly Ampu, but John and I vetoed such a plan, for as John said, we didn't know how far we would have to go, or what direction to take.

"Labvo directed our attention to some deep scratches on the walls, which seemed very old. For quite a long time we studied them carefully, but could make nothing of them. Meanwhile the Ampu began cleaning them and retracing the more obscure lines. Presently John asked Labvo to explain them.

"'We think it is the beginning of the history of the Ampu,' Labvo told us. We three went at it again, and after John had begun to trace over those ancient scratchings with chalk, of which the Ampu had supplied us with plenty, we began to decipher the meaning of the scratches.

"'Here,' said John, 'is a drawing of a great hairy ape. That circle high up must be the sun.'

"'And here,' said Jim, 'is another weird critter that must be intended for some sort of animal.'

"'One of the great prehistoric animals,' said John. 'I wish I'd read more about that sort of thing.'

"'Prehistoric nightmare, I'd call it,' said Jim as he continued tracing dim lines, 'but I remember seeing something of the sort in a museum at some time. I think it was called a Brontosaurus, or some sort of a saurus, anyway.'

"My own contribution began to take form to something like an elephant.

"But John said that it was one of the great extinct mammoths, and that those upright things by the side of it with the radiating lines above were trees.

"'I would have given ten years of my life and all I possess to have made the sort of discoveries that you men did,' interrupted Professor Small. 'But please go on, Mr. Everett.'

"Well sir, that drawing covered a great stretch of wall, and John presently suggested that we take a look at the thing as a whole. We stepped back and told the Ampu that we were going to put on our torches to their full extent so they drew far back and adjusted their goggles.

"WE discussed it for some time before the solution dawned upon John. He then called Labvo, but the other male Ampu, who was called Tora, seemed to know more about it than the others.

"'Look here,' said John, 'If, as you say, this is the beginning of your history, it must have had its beginning in the upper world where we came from, for that circle must represent the sun, and these animals could not have lived in these caverns, and that ape, or Neanderthal man, or whatever you choose to call it, must have been one of your ancestors.'

"'I'm glad to hear you say that,' said Tora, 'for it has been a matter of controversy among our wise ones for ages. Some claim that we came from the upper world, as you say, and to which theory I hold, while others claim that we were created by Octram-ka-listrol.' As he mentioned the gods of the center, each of his companions made that peculiar salute. 'But, if what you say is so, why are we so different from this creature?' and he pointed to the drawing of the hairy ape.

"'All a matter of evolution,' John told him. 'I'll try to explain that to you sometime, for we ourselves are supposed to be descended from the same sort of creature. Yet we are very unlike it now.'

"They then conducted us to another cave, where we commenced work in restoring another scratch drawing. The work went rapidly forward this time, for we had a better idea of what to expect. All the Ampu took part in it, now, except one of the females, whose name was Keraub. It was she who had helped us in our first attempts at cooking in the communal kitchen. She had also been greatly interested in our education, and for some reason had been a close attendant upon John, at times to the point of embarrassment. She now drew from one of the bags six thin slabs of some composite material with which she erected a sort of box. There were no fastenings, but the edges of the material seemed to adhere to one another naturally. Then she placed a small instrument on top and in a little while had prepared food in what, I perceived, was a portable oven, which obtained its heat from wireless electricity through the little instrument on top.

"Several times, while we were eating, Keraub transferred from her own to John's platter, what she evidently considered tid-bits. Jim and I chaffed him quite a bit, in our own language, about his scaly flapper, which embarrassed him greatly, but the other Ampu seemed to take Keraub's actions as a matter of course.

"When we had completed our next picture, we were greatly puzzled, and had it not been for the sort of general knowledge that John had acquired in his winters at the public libraries, we would never have solved it.

"At one side there was represented what we took to be some low cliffs with a large hole at the base. Above them the figures of the sun hung low, around this hole were several figures of the hairy apes, but all were looking backward over their shoulders, except one that was entering the hole. There were a number of animal figures also entering, mostly lizard types. Almost at the far side of the cave was what appeared to be more cliffs, but there were trees growing out from the foot of these. All were bending forward, and some were prostrate as if the cliff had rolled over on them. In between the two sets, of what we thought were cliffs, were a number of prehistoric animals and men lying upon the ground as if asleep or dead. The picture was fairly realistic in a crude sort of way, but it puzzled us greatly, and the Ampu seemed to be unable to help us.

"'Well!' said Jim at last, 'it means something. Couldn't it be that that is water piled up back there—a tidal wave or a sort of Noah's flood? Look at the number of animals that are going into the hole.'

"'No,' said John, 'I think these creatures were more intelligent than to go underground in the case of a flood; and a tidal wave would have been equally disastrous.'

"I suggested that perhaps, seeing the way the trees were bending before the opposing cliffs, it was an earthquake.

"John pondered that solution for a time, then said, 'No, I think the same objections would apply. It was something more prolonged than earthquakes and floods, judging by the permanence of the results upon our friends, but we may be sure that it represents some sort of catastrophe.'

"At last John said, 'I think I have it. You two have heard of the great glacial periods: geology proves that there were times when ice practically covered what are now the temperate zones of the earth. Well this picture represents the advance of the ice age, when these hairy apes, which some of the Ampu claim were their ancestors, took to living under ground, and I guess that's how they came to discover that the earth was honeycombed with caverns, which, as we ourselves have discovered, are habitable.'

"We agreed that that was the most practical solution. Then John attempted to explain it to Tora, but he couldn't seem to find the exact words in the Ampu

language. We had never heard the word for ice, and when he spoke of solid water, and then tried with absence of heat, they only smiled uncomprehendingly; it seemed to be something quite outside their experience.

"Finally Tora said, 'We do not understand this ice; perhaps our wise ones have knowledge of it.'

"We gave it up at that, and then went on through a great number of caverns, at great speed, in which Labvo said there was nothing of interest.

"When the lofet slowed up again in another great cavern, we found enough to interest us without having to do restoration work. There were numerous figures on the walls which had been carved in low relief, and the work had been well done. The figures were also very different from the ape-like figures of the other caves; they had a more human appearance; they were comparatively hairless—that is, they did not present the shaggy appearance of the ape figures, but were more like ourselves, smooth of skin.

"The figures were divided into two groups; one group was standing or squatting about in various listless attitudes, with their eyes turned toward the other group, which was marching away from them. In that group the ancient artist had depicted a fine vigor of action; each of the figures was loaded with some sort of bundle, while at the rear was one heroic figure walking backwards, a spear in one arm, stretched toward the direction in which the others were moving, as though inviting the other group to follow.

"'It looks,' said John, 'as though this picture were not so ancient as the others by many a generation, though there was time enough evidently for evolution to have got in some good licks, judging by the difference in the appearance of these figures. The picture seems to represent an emigration: some one has evidently found a place where conditions for living were better, but as usual, some of them are satisfied where they are.'

"'This fellow behind,' said Jim, 'is evidently the original Christopher Columbus.'

"Keraub, Labvo and Tora agreed with John that these were probably their ancestors, although they could not understand the difference in form.

"Ishtu shook her head and could not agree. 'No,' she said, 'these are a people who were lost; the Ampu were created as they are now by Octam-ka-listrol.' Again they all made the salute.

"JOHN drew us away from the Ampu toward a large pile of rubbish, and then spoke quietly and earnestly to us. 'Look here fellows, we're stuck with these Ampu, for a time anyway, and it looks to me as if that difference of opinion about their origin may lead to trouble; let's try to avoid it.'

"We made a pretense of digging around in the pile of refuse, and threw out some pieces of stone bowls and other utensils. Jim thought at first they were pottery, but we decided that they had been carved from natural rock. Most of them had a design upon them, which John said was the sun, and all of them had a carving of an elephant or mammoth on them. John thought that perhaps the idea had been handed down from their ancestors who had lived on the surface, and these two things—the mammoth and the sun—were probably their gods. We also found a number of bones, some of which John thought were human, but others were too large, and were probably the bones of animals.

"John said that if some of our scientists could see these things, they could probably reconstruct the whole history of these people.

"'Ah!' said Professor Small, 'Any paleontologist, archeologist or ethnologist would have given his right eye to have seen what you men saw. But I interrupt—please continue Mr. Everett.'

"Ishtu seemed to be anxious to go on, and seemed to have lost interest in the whole thing, so we wasted no time in getting back to the lofet. Soon we were speeding through the tunnels again. When we stopped, Labvo said, 'Here are the last of the pictures which we wish to show you, but there is something else near here, of which we hope you will not be afraid, for there is nothing to fear.' And I thought that he handled the little cone hanging upon his chest rather lovingly.

"The pictures were of an entirely different character, and had evidently been carved at long intervals of time. Nearly all depicted scenes of fighting with monstrous beasts. In the earlier pictures, the people were much like those we had seen emigrating from the upper cave. They were armed for the greater part with what appeared to be stone axes, though some were armed with spears.

"John thought that they must have discovered the working and use of metals, otherwise they couldn't possibly have had access to timber for the shafts of their spears.

"The beasts they fought with were different from anything that John had ever seen in his readings of prehistoric beasts, and Jim said there was nothing like them in the museums he had wandered through. So far as I am concerned, I have never seen anything like them even in a nightmare.

"When we came to the pictures of more recent origin, we saw that there was a gradual change in the figures of men. Evidently there had been an attempt to depict, in some figures, scaly bodies and the horny cap upon the head; almost as if two different peoples were mixed up. Here Ishtu seemed to want to argue the questions of origin again; she claimed that the Ampu had found these strange lost people here, had mixed with them, and helped them to overcome the monstrous beasts.

"John drew us away from them as the argument seemed to develop a rather strong feeling, but I noticed that Keraub came with us. She seemed to have no interest in origins.

"While we had been interested in the pictures, we had heard, faintly, some strange, rumbling, echoing sounds that reverberated through the tunnels and caverns hollowly, like distant roaring and shrieking.

"Jim asked what those noises were.

"'You will be shown,' Keraub answered, and she seemed to shudder. 'When they are ready,' and she waved her hand disdainfully toward where we could still hear the voices of controversy.

"When the three came up, Ishtu seemed to be having the last word, and Jim commented that she was like all the rest of the ladies, thus proving that they were as human as we were.

"When he had spoken there came a tremendous roaring that seemed to make the air quiver, then Ishtu began to tremble and shake until her scales rattled.

"'More proof!' said Jim, laconically.

"'Come,' said Labvo, 'We will show you where the great beasts were driven and penned in.' He started

away at a rapid pace, closely followed by Keraub, with us three in close attendance, Tora following Ishtu, in the rear.

"We came at last to the entrance of an enormous cavern, the entrance, as usual, protected by the charged bars. When the Ampu had taken a position behind us, Labvo told us to turn on our lights to their full extent. We saw then what we had never expected to find underground. Stretching before us was a great lake, the roof of the cavern being supported by innumerable, gigantic pillars. Although our lights seemed to be as powerful as any searchlight, we could see no farther shore. But from all over the lake came those eldritch shrieks and roars, and we could hear the plunging of great bodies, while the water seethed in turmoil. Dimly, at first, we saw the monsters moving; then they came toward us, attracted by our lights. We had approached fairly close to the water's edge when a monstrous head shot up out of the water and lunged toward us; we all turned to run back, but John slipped and fell, and that monstrous head and long neck towered above him ready to strike downward. Keraub stopped and leaped back past John, right under that towering head; with a wild cry she snatched the cone from her neck, directed it at that awful head and in a moment it fell with a crash to one side, while the great body slid back into the water. The terrible ray, or whatever power was contained within the cone, continued to play on one of the supporting pillars of the roof and brought it down with a crash.

"With a shout, Tora and Labvo snatched their cones from their breasts and aimed them at the point which the pillar had supported. Immediately the rocks of the roof seemed to fuse and run together into a solid monolith.

"If ever anger was depicted upon the face of an Ampu, it was upon the face of Labvo as he advanced upon Keraub. Jim and I immediately placed ourselves between the two, and although we had dimmed our torches we were ready to flash them on full in Labvo's face. They were the only weapon we had, but we were prepared to use them, even knowing that we could be annihilated by the deadly cones.

"Fortunately, Labvo had no intention of wreaking bodily harm; he only demanded that Keraub turn the deadly cone over to him. 'You know,' he admonished her, 'that law of the Ampu—Anyone who uses one thillode of power of the kusom more than is necessary, is not fit to be entrusted with one, and is, therefore, deprived of its use for four hundred days, for the first offense, unless the council, on hearing the circumstances, shall decide otherwise.'

"Keraub handed over the kusom meekly enough, and said, in a voice that trembled. 'I know, Labvo, but it was John.'

"'I understand, Keraub,' said Labvo, with a quiet smile, 'but the law must be obeyed.'

"WE were all badly shaken by the terrible experience and very anxious to place those charged bars—which, Tora assured us, nothing living could pass, under or over, unless the current were switched off—between us and that awful lake.

"We made a rapid return to the home cavern. After resting for a time, we were called before the council, where Tora gave a report of the expedition, and as far as he was able, gave our interpretation of the pictures. We were sorry that he had done that, for the question of origins had been raised again, and there arose the sound of many heated arguments throughout the crowd. The oldest Ampu, however, who seemed to be a sort of leader, chief, or patriarch and was greatly respected, tottered very feebly to his feet, and raising his hand, commanded silence; then he spoke in a thin and quavering voice.

"'This question of our origin has been before the Ampu for many generations; it can surely wait a little longer. The Ampu of the upper world have referred to a great catastrophe which they call ice, which must have been caused by their gods ages ago. They seem to have a knowledge of this ice and we should like to learn what it was. Let their speaker stand forth and explain.'

"John did his best. He called for water; then, holding the utensil in his hand, he tried to explain the absence of heat. He reminded them that when their ovens were hot, you could not place your hand upon them, but after the current was gone, they got cool enough so that they could be handled without injury. 'When this change goes further,' he said, 'this takes place.' He then poured out the water and replaced it with a large crystal, which he had brought with him for the purpose.

"One of the council here spoke to the old chief, who smiled and stood up again and said, 'One of the council informs me that in one of his experiments this thing happened—that water became solid like the crystal. It seems that in the upper world this is a natural and common phenomenon, which has no counterpart here.'

"'Now,' said the chief to John, 'explain what happens when all water becomes solid.'

"'Nothing lives,' said John.

"'Then how did the Ampu of the upper world, from whom you say you are descended, manage to keep themselves alive?'

"John explained how the glacial catastrophe extended only over certain zones, leaving one wide zone, which was kept warm enough by the sun to sustain life. To that zone our ancestors retreated, instead of entering the caves as the Ampu had done.

"The Ampu expressed their comprehension, but the patriarch wanted to know how our forms had changed from that of the pictured apes to what they were now.

"At that moment I caught sight of Pulebsus, the superintendent of the spiders, and I whispered to John to call Pulebsus up and have him tell how the spiders were developed.

"The idea delighted John and he at once called Pulebsus over and explained to the patriarch that within their own experience was a parallel to what had happened to us.

"Pulebsus was in his glory when he began to talk about his spiders. He explained how a certain Ampu many generations before had been curious about the fabric of the spiders' webs and had noted that some constructed a closer and stronger mesh than others. He experimented and from among them had selected those with the larger bodies and the larger spinarettes. These he had isolated and intermarried. From the offspring of these he had selected the more tractable and with infinite pains had commenced to train them to make their webs upon frames. But so large a work had the experiment become that he had to get the help of some friends, some of whom were unfortunately bitten by the spiders

and died. He then selected those with the smaller poison glands until the poison glands were completely eliminated. The spiders, meanwhile, owing to the artificial selection that was going on, developed greatly in size, with the result that the spinarettes were developed in proportion, and they produced a much thicker thread. At the same time they were trained to make the mesh of their webs closer, which developed a greater flexibility of body, until they were producing the thick, soft fabric with which all Ampu were familiar. Pulebsus would have gone on talking about his spiders indefinitely had not John signified that it was enough.

"'Now,' said John, turning to the patriarch, 'those same laws that operated to develop the spiders until they were of service to the Ampu are the same laws that operated upon the Ampu of the upper world, although not consciously applied. The desire to live demanded certain actions; the constant repetition of those actions developed their bodies for an easier performance of those actions, until a new characteristic was formed. Those developing the new characteristic intermarried with others possessing it, where it was recognized as an advantage to the individual, until a new and permanent type was developed. From them, with the constantly changing conditions of life, new types were formed until, as you see, we are like, yet unlike our original ancestors.'

"'That,' said the patriarch, 'is an idea that it would be well for our council to consider. Can you tell us the history of your people from the time of the ice till now?'

"'I'll try,' said John.

"He then commenced to draw pictures, showing the development of our race from the crude savage form to man as he is today. He gave an idea of mechanical developments from the first crude stone axes to the forms of modern steam and electrical appliances, explaining as he drew, showing everything he could think of from the naked savage of early times to the clothed and intelligent forms of today; showing also the advancement of building from the rough wigwams of boughs and skins to the great skyscrapers of our cities, and from the rough dugout canoes of the ancients to the modern ocean liners. He had gradually developed considerable skill with the chalk until, with a few lines and a few words of explanation, he could carry the Ampu through a whole generation of the advancement of civilization. But by the time he was finished he was almost exhausted, for it had been work to which he was not accustomed.

"'A very wonderful history,' commented the patriarch, while the Ampu wandered up and down the great cavern, discussing the various pictures, but they seemed to be especially interested in the history of machinery.

"Suddenly Jim, who had been a silent spectator, sprang up and, addressing the patriarch, said, 'That stuff is all right as far as it goes, but it doesn't tell you the half of it. Look here, I'll show you.'

"Picking up a piece of chalk, he began to draw with far more facility than John—we hadn't known that he possessed the gift. His drawings were above those of John's, and each was apparently contemporary with the one beneath, but it was a military history of our race.

"As soon as John realized what he was about, he sprang to his feet and shouted excitedly, 'Stop it, Jim; do not let them know that side of us. I have purposely avoided it.'

"'Aw shucks,' he replied. 'This can't do any harm; if we let them know what we can do, they won't want to start any monkey business with our people up top.'

"In spite of our expostulation, he went on showing the slaughter of men with various weapons, until he arrived at the time of the World War, in which he had been a participant and which he made more realistic than ever with the dropping of bombs from planes, the bursting of shells from great guns, the demolition of buildings and the slaughter of armed men as they rushed hither and yon in the turmoil of battle; he seemed to delight in the carnage he was depicting until he, too, was tired out. Then, turning with a smile and a bow to the silent Ampu, he said with a show of conceit, 'And that, ladies and gentlemen, will conclude the performance for the present.'

"The Ampu turned their backs upon the pictures, but forming into groups, conversed in low tones very earnestly. The members of the council were also drawn together and were evidently discussing Jim's revelation, but no one complimented him on his performance. It was very flat for him.

"The Ampu presently began to disperse silently and we also retired to the cavern where we slept. John seemed very depressed and told Jim that he greatly regretted having shown the Ampu the war pictures. In fact, he feared that the chances of our ultimate return to our own place were considerably minimized, for the Ampu had now received such a poor impression of our people that they could not want them to learn of that underworld and its inhabitants.

"'Well, I guess they needed something to stir them up,' said Jim in extenuation of what he had done. I was inclined to agree with him at the time, for the majority of the Ampu seemed inactive and apathetic. Only those who accompanied us on the expedition to the upper caves with a few others seemed to be at all interested in exploring the uncharted caverns. A few others had some definite occupation, like Pulebsus of the spiders, and some were interested in the growth of the vegetable crops, while all were obliged to take part in the harvesting, but once the products had been gathered into the great store-caverns, machines took care of the rest. In fact, machines had at one time been installed to take care of the preparing and cooking of foods, but the council had had them destroyed, for they were found detrimental to the welfare of the people. The machines, you see, left the majority of them nothing to do.

"There were certain machines to be watched, but those duties were delegated to the priesthood, of whom we learned later. Some few of the council were interested in scientific experiments, but most of them seemed to spend the greater part of their time in philosophic reflections, which got them nowhere.

"For the most part they were an apathetic and indolent people. The making of machines seemed to have reached the saturation point and they did not seem to understand the art of amusing themselves.

"For two or three days after the report of our expedition we loafed about like the rest of the inhabitants, and then, one night, we were roused from sleep by an earth tremor which seemed to shake the foundations of the caverns.

"When the light came on again we proceeded to breakfast as usual. We met Tora and Labvo, who told us that there had been a disaster somewhere and they were now waiting the report from the Ampu in charge of the instruments for recording that sort of thing. Investigations, they said, would be started as soon as the definite location was ascertained.

. . . she sped around the cavern, then around on the walls and finally made several circuits of the roof in an upside-down position.

The Lofet

"BY the time we had eaten breakfast the report was in, and a company of them, armed with the deadly kusom, prepared to leave. Ishtu refused to go on the expedition, but Labvo inviting us to go along, Keraub at once attached herself to the party, although she no longer carried the kusom.

"There were three lofets to carry the company. There were no doubts as to the exact location of the disaster. so we soon arrived at the scene. John said it was what geologists called a slip, but it seemed to be miles in extent. The Ampu at once set to work with their kusoms to weld the edge of the rocks that had slipped to those that were still stable and so prevent them from further slipping.

"As this work would occupy some time, John and I returned with Keraub to the lofet. There I asked her to explain the working of the machine. She showed us where, at the front of the car, was a machine which, she said, collected the two forces which were sent out through all the caverns by the great machines near the

center. The lofet was more like a bob-sled with seats than anything else. Underneath it was composed of thin slats of different kinds of metals, none of which John or I could recognize. There was a dial in front of the driver's seat with a lever, which opened or closed any combination of these slats at will. Certain of the metals were operated upon by one of the two forces and other metals by the other force, yet other metals were acted upon in unison by the two forces.

"'What,' I asked, 'is the difference in effect of these two forces you refer to?'

"'One force,' said Keraub, 'lifts the lofet to any desired height, while the other force drives the lofet in any direction, at any speed, the driver having perfect control. Generally the two forces are used together, one raises the lofet a few inches above the floor to avoid friction while the other drives it forward. When the driver wishes to ascend great distances, as we did in coming here, then only one force is used; when he wishes to descend, he cuts off both forces and the lofet drops; an instrument warns him when to apply the forces again to prevent a smash. The two forces can be so combined that the lofet can be made to travel at any angle of ascent or descent.'

"'It sounds to me,' said John, 'as if these Ampu understand the force of gravity as well as electricity. What a find it would be for our scientists!' Then turning to Keraub, he added, 'I should like to see this lofet in operation; so far, our only experience of it has been in the dark.'

"'Take your seats,' she replied, 'and in a cavern not far from here, where the walls and roof are smooth, you can see by the light of your torches how it works.'

"She told us to dismount when we reached the caverns. Then strapping herself in and securely fastening the goggles, which she always carried when in our company, she sped around the cavern, then around on the walls and finally made several circuits of the roof in an upside-down position. I noticed that the steering was done by a sharp metal prow at the front of the machine, which moved in a universal joint, just as one sees a gliding sea gull change its course by a movement of its head, the control being perfect.

"'There,' she said proudly, when she at last brought the machine to a stop near us. 'Have you anything like that among your machines, you surface Ampu?'

"'Yes,' John replied, 'we have a machine of recent invention that will perform the same evolutions far above the earth, although the design and the power that are used are very different from yours.'

"'I should like to visit your people, John,' she said with a sigh.

"When we returned to the place where we had left the other Ampu working upon the slip we found that they had almost completed their task, and Jim, who had stayed to watch the operation, greeted us with: 'Boy! oh, boy! if I only knew the trick of those kusoms—wouldn't they play the deuce in the next war!'

"Tora and Labvo now asked us if we would like to see some other things of interest. We expressed an eager desire to see everything that they cared to show us. They took us on a long run in the lofet; in some places we seemed to be dropping straight down great pits with a spinning motion—down and down, it seemed for miles; then after another horizontal run we would drop down again. It would have been like dropping down in an elevator in an exceedingly tall building, except for that spinning motion which made us dizzy. We did not talk much, for it was all my stomach and head could do to take care of themselves in those dizzy descents. We were nearly three hours on the way.

"When we finally reached our destination, I began to feel a pricking sensation all over my body and my hair seemed to be standing up and waving to and fro. The three Ampu went into conference for a few moments and then Labvo came to us and said that before we could go further we must take off our clothes.

"Taro told us that to carry metal, such as our belt buckles, watches, pocket knives, and some metal buttons that were on our clothes, would endanger our lives where we were going.

"Jim, with his usual obstinacy, said that he didn't care whether he saw anything more or not, but finally decided that it would be better than staying in that place alone when he saw that John and I had overcome our scruples and were preparing to go with the Ampu. When we had gotten rid of our clothes, they provided us with some thick sandals, made of some flexible insulating material unknown to us, and provided themselves with similar ones. There was a great quantity of them in a small cave close by.

"As we advanced through the caverns that pricking sensation became more pronounced, and I noticed that whenever we came into contact with each other, minute sparks would flash over the contact. Everything seemed to be charged with electricity, but the Ampu continued to assure us that there was no danger so long as we touched none of our surroundings.

"PRESENTLY we came to a cavern of great size, the floor of which was liquid. I thought of the probability of monsters, such as we had seen in that other underground lake, but the liquid was clear so that we could see the bottom, which was of some crystal-like substance, that seemed to have been molded into a surface like glass.

"Then we saw pillars, that seemed to be of metal, sticking up here and there out of the liquid, and from the top of them, extending to each other, a complicated system of thick metal rods.

"We realized that each of these great caverns was a system of great storage batteries. John asked where the machines or dynamos were that produced the enormous amount of electricity. The Ampu seemed to hesitate in answering. Finally Tora said, 'Octram-ka-listrol.'

"'Hm-m;' said Jim. 'I could have told you that. Anything they can't or don't want to explain, it's always Octram-ka-listrol. I begin to think that it's only a bug they have.'

"They took us into other caves where, along each side, tier upon tier, right up to the roof and apparently extending for miles, were rows upon rows of thin, narrow strips of metal.

"'These,' said Tora, 'collect the power.'

"'From where?' asked John.

"'Octram-ka-listrol,' said Jim with a grin.

"The Ampu looked at him with a peculiar expression, but said nothing more.

"They showed us other caverns that were arranged with the tiers of metal strips, but of a different metal. 'These,' said Tora, 'distribute the power to all parts of the caverns, through the atmosphere, and all machines are so constructed that they draw upon this power, wherever they are, by means of miniature transformers.

"Although John did not like to urge the question, he suspected that Octram-ka-listrol was some sort of machine, constructed by a mechanical genius in times past, and for which the Ampu had developed a reverence which amounted to worship. The truth of the matter never suggested itself to us, and the Ampu seemed horrified at the idea of explaining it to strangers. But we were to learn, John through the wonderful affection which Keraub developed for him, and Jim and me in a terrible manner, which cost Jim his life.

Politics

"WE returned to the upper caverns and there for a long period spent our time in monotonous inaction. John, in talking to me one day as we walked up and down the cavern, like prisoners in penitentiary cells, said, 'If this continues very long, Joe, I'm afraid we shall suffer for it mentally. How the Ampu stand for it, I don't know. I'm a little afraid for Jim, too. He's getting more argumentative every day, and the only thing he can talk about with the Ampu is the question of their origin; his principal controversialist is Ishtu. He seems to delight in antagonizing her, and I have a suspicion that she is preparing something unpleasant for us.'

"We were finally reduced to indulging in childish games, in which some of the Ampu became interested and finally took part, but even that became monotonous. Jim wished that we had a deck of cards and so did I for Jim's sake.

"One day Tora came to John and invited him to attend a conference which was being held surreptitiously by some of the Ampu. John asked if his two comrades might attend.

"Tora replied, 'Joe may, but not Jim. It is only a few of the council who are anxious to inquire into certain questions to which you seem to hold the key.'

"When Tora had departed, John and I strolled casually toward the end of the cavern, then, following the instructions that Tora had given us, passed through many small winding tunnels until we came to where a tiny spark of light shone upon the ground; here we paused and were at a loss, for we could see no sign of the cave of which Tora had spoken. However, as the light was the sign by which we should know that we had reached our destination, we waited. Slowly we saw a rock in the wall of the tunnel turning on a pivot and a hand appeared, beckoning us to enter.

"Inside the caverns we found a company of the very old men of the council and among them were Tora and Labvo, the only young Ampu present. After we were seated on a rock bench, one of the Ampu addressed John.

" 'We are greatly concerned,' he said, 'about the welfare of the Ampu. During the last few generations most of them seem to have lost interest in everything; they perform the few duties that are necessary and then spend their time in doing nothing. They do not seem to have energy enough to be discontented.

" 'This seems to us to be a very bad condition, for we find by tests that the average of their mentality is growing lower. They are fast descending to the level of the beasts which we kill for food; we, of the council, who are here, dread what the future may bring if this trend continues. Our civilization will decay until the Ampu become like the ambala, which eats what it can find, sleeps and dies.

" 'We have noted that you of the surface are of a more vigorous and energetic race, and we are conscious that you are observant and thoughtful; we have also considered the many things you have told us regarding your people and have tried to see in what, essentially, they differ from the Ampu, and whether it would be advisable to change our economic system to conform more to the system that is in vogue among your people, and, if we do, to consider carefully what effect it would have upon the present and future generations of the Ampu.'

"John sat silent and thoughtful so long that I began to wonder if he were going to speak at all. The Ampu, meanwhile, remained thoughtful and patient. At last he spoke.

" 'You have placed upon my shoulders a great responsibility,' he said. 'I do not feel that I am competent to advise, for it means the welfare of a whole people. The best I can do is to draw a comparison between the economic conditions that exist among your people and among mine; it will then be for you to decide what action is best to be taken. I am hardly fitted even for that task, for I am one of the lowliest of the race of men, lacking in education, and with practically no knowledge of the economics of government. The changes which you wish must come from within the people, rather than from the outside forces, so that it will be rather for you of the council to lead them into a more vigorous mental and physical mode of living than to try to drive them into it.'

" 'Well spoken!' said Onslath, who seemed to be the leader of this section of the council. 'We admire your humility and respect your reluctance to advise in so grave a matter. The onus of any change will be upon us, we of the council who are here. Now, if you will make that comparison which you have suggested, we will take the matter into very careful consideration among ourselves and decide later if anything shall be done. At the same time we wish to assure you that we shall in no way be offended if the comparison is derogatory to the Ampu, but shall admire your courage the more.'

" 'It seems to me,' said John 'that the whole matter can be summed up in one word—work. The Ampu have reached that stage which we consider the top stone of happiness—no need to work. But this state, I see now, is far from desirable. The Ampu have but one necessity and that necessity is food. In your former generations food was provided by your ancestors by the invention and building of machines which take care of that essential almost without effort on the part of the present generation. In fact, so well did they work that the machines were constructed of materials that seem never to wear out, so that there is no call even for occasional repairs. As to your source of power, I know nothing of it, but hope to learn.

" 'The deplorable indolence and apathy of the Ampu is the result; they are surfeited with leisure. There is no reason why they should be mentally or physically active, and it is an axiom on the surface that that of the mental or physical which is not used becomes atrophied and can no longer be used.'

" 'You have shown us,' said Onslath, 'exactly the case of the Ampu. Now show us wherein the surface people differ.'

"John gave them a long description of our civilization, which was made much longer than it might have been, because he had to stop to explain so many things of which they had no experience. For instance, they knew nothing of snow, wind, rain, the oceans and many other

things which are common knowledge even to the very young children among us. In effect, he said:

"'The environment of the Ampu and of the surface people is very different. We of the surface have more actual needs than the Ampu, and many things that we did not need at first are as necessary to us now as food.

"'The Ampu need no clothes because the climate in which you live makes them superfluous, but among us clothing is necessary to protect us from the elements and provides a vast amount of work for a great multitude of people.

"'Then, for further protection, we must have shelter, and the building of dwellings provides work for more thousands. Still more thousands do nothing but provide food for all. The proceeds of their labor they exchange for fuel, light, shelter and clothes. But we also are fast approaching the stage where machines will soon be providing all those things; our machines already do a vast amount of that work.'

"'Then soon,' said Onslath, 'your people will be like unto the Ampu.'

"'Not for many generations,' said John, 'because when these necessaries are supplied, we reach out for other things that contribute to our happiness and comfort.'

"There was a movement among the assembled Ampu at this point, as if they were anxious to miss not a word of what was to follow.

"'We have conquered nearly all of the great elements,' continued John, 'cold, heat and storm, as well as the great beasts of prey which threatened our existence. Then we conquered land, water, and air, and harnessed them to our use. The land we made to produce of its best in foods; the water, a great barrier between lands and peoples, we conquered with great machines, so that we now have intercourse between all lands and all peoples and exchange our products as well as our thoughts and inventions. The air we have conquered but recently. It remains to be seen where that conquest may lead us. Two great things alone remain to be conquered, time and space, and we are making strides in that direction. We are conquering time with speed, and space, the space of which you, confined to these caverns, have no conception, we have begun to conquer with the conquest of the air and with another great invention by which one man can speak to another, and even see him, thousands of miles away.'

"'All this,' said one of the Ampu, 'has but little bearing on the case of the Ampu, for these elements of which you speak and which were, for the most part, inimical to the existence of your people, play little or no part in the experience of the Ampu.'

"'No,' said John, 'you are right, but I mention these things because the continued struggle to overcome them is what has developed our race physically and mentally, and the continued overcoming is what has kept us, and is keeping us, keyed up to and advancing our high standard.

"'Now we return to the economic system of the Ampu. The Ampu hold all things in common; what belongs to one belongs to all, without effort on the part of the individual, and what they now have is the limit of their desire. Among our race, if one would possess anything, even the common necessities of life, even food, he must first give an adequate return in useful labor. And among us desire of possession is the greatest incentive to labor. We have invented many things which are not necessary, but pleasing, pleasing to each and every one of the senses, and it is the desire of everyone to possess those things for himself alone, and also to possess so much that more labor becomes unnecessary for him. Few attain that desire, but in the effort their mental and physical qualities are improved in the struggle, so that everything makes for the improvement of the race and the happiness and contentment of the individual.

"'So,' he continued, 'as far as I can see, the only answer to your problem is to create a desire for things that are not necessary but pleasing. First they must be invented; then a return commensurate with the effort of the inventor or maker must be demanded, so that all will find happiness in labor and its rewards and joy in possessing those things in which his fellows have no part unless they put forth the same amount of effort.'

"They plied John with questions regarding the things which were solely for comfort and pleasure, which he answered to the best of his ability, and they decided that something of the sort must be done to stir the Ampu out of their indolence and apathy.

"John and I had many talks about this time, and time went more pleasantly for us, as we were being constantly consulted by the radical element of the council, who were beginning, secretly, to try to work out things for the salvation of the Ampu.

"Meanwhile Jim was fast stirring up trouble among the Ampu with his continual controversy about their origin; in fact, they were fast developing into two combative parties, with Jim at the head of one and Ishtu at the head of the other.

"Our expostulations were all in vain. He only said, 'If you think I'm going to mope around like you two, you're badly mistaken. I get a kick out of this, and before long I think I'll have them scrapping, and then, oh, boy, won't we have fun!'

"'We have warned you,' said John, 'that your fun may lead to disaster, and much as we like you, Jim, we will take no part in protecting you from anything you bring upon yourself through wilfulness.'

"'I'll take the consequences of anything I do without any of your interference,' he replied and walked away.

Octram-ka-listrol

"WE saw little of him during the ensuing days, but Keraub was as the shadow of John. He had overcome the embarrassment he had at first felt from her constant attendance and had learned much from her regarding the history and methods of life of her people. One day he said to her, 'Keraub, you have not been fair to me. I have asked you many times about Octram-ka-listrol, but you have always evaded the question; now, if you really like me, tell me whether the sign of the eight spheres swinging on the two orbits is a sign of your gods.'

"She seemed almost ready to swoon with fear as she answered, 'Oh, John, it is forbidden, but yes, yes, the sign is the sign of Octram-ka-listrol.' And hurriedly she left us.

"It was several days before we saw her again. Then, looking very pale and sad, she came and sat down by John's side, where he and Tora were very earnestly talking about something that Tora was trying to invent.

"When Tora had gone, Keraub said, 'John, I wish to show you something.'

"'Can Joe come too?' he asked.

"She seemed terror-stricken at the thought.

"'Go ahead,' I told John, 'and I'll give some explanation of your absence if inquiries are made.'

"It was two days before they returned. Keraub had such a frightened look that I advised her to hide until she felt better, and John had such a rapt, awe-struck appearance that I seemed hardly able to talk to him. At last I asked him, 'What is it, John, did you see the gods?'

"'Sh-sh,' he answered, although I had spoken in English, which none of the Ampu understood. 'I can't tell you now, Joe; it's—it's stupendous.'

"He sat down and buried his face in his hands. During the next two days he went about like a man in a daze, but at last he seemed to recover his wonted composure, and I was pleased to see that Keraub was beginning to look more like herself. When she sat down by John, he treated her very tenderly.

"Turning to me, as he fondled one of those scale-covered hands which rested upon his knee, he said, 'Joe, if only Keraub was of our race, I should love her as much as any man ever loved a woman, as it is, I can only feel sorry that she feels as she does about me. But what she did for me is heroic, and a horrible death awaits her if it is ever discovered.'

"'Come,' he said as he rose to his feet with a reassuring smile for Keraub. 'I will tell you now, but let's get away from everybody first.'

"We had gone some distance before he spoke again. 'Joe,' he said, 'what I shall tell you has never entered the mind of man before. Our scientists seem to be all wrong about the structure of the earth. Their conception of the center of the earth is that it is a molten mass, that through enormous pressure has the density of a solid. A mass that is in density about like iron. A pressure that makes a fluid more rigid than steel. I think that is their principal theory. They have others, of course, as they always do where nothing is proven. They also have a theory of tremendous heat, which is beyond the recording of their best instruments. They are undoubtedly wrong again. As you must realize, we are probably several hundred miles below the surface of the earth, yet the heat at this point is bearable. Of course it is of a tropical temperature, with very little variation, but I think that it is produced rather by atmospheric pressure than by an internal source of heat. I have been at least a thousand miles below the surface, and the temperature is not more than a few degrees above what we find here. But what I found there would revolutionize all scientific thought if it were known on the surface.

"'Keraub took me to a place which she alone knows, unless some others have kept the secret to themselves—that is one of the possibilities that she feared more than anything else. She came upon it by accident and never spoke of it to anyone. It is a place deep within the caverns, where one can look upon the most stupendous sight in nature: the internal mechanism of the earth. No wonder the Ampu look upon it as the dwelling place of the gods.

"'In a very small cavern, which we approached through many narrow crevices, we came to a place where a small portion of the floor was of the clearest crystal, so clear that it seemed to the sight as though nothing were there except a hole in the cavern floor. How thick it was, I could not judge, for there was no flaw in it to help the eye; it may have been miles in thickness, but one looked through it as through plate glass.

"'When we came to it, Keraub merely pointed to it and fled the way she had come.

"'As I knelt at the edge of the crystal floor, I saw there was a faint, moving, luminous glow. But as I watched, there swung into view, far away, a great luminous sphere; it glowed softly with a bluish light. I have tried to estimate its size, but naturally that is impossible without instruments or the training of an engineer or astronomer. Still, I should say at the lowest estimate it was fifty miles in diameter. It seemed to be swinging in a slow orbit. Beyond, far away, like large stars, I could see others swinging. I watched, fascinated; time was as nothing. Then slowly came another, swinging along the same orbit, but different from the first, for there issued from it great flashes of light like lightning that seemed to illuminate the whole of that hollow sphere we call the earth. Away, at what seemed to be the center, was one great, brilliant, glowing sphere that seemed stationary.

"'I must have watched for hours, though it seemed like seconds, till four of those moving spheres had passed, and I saw that a second orbit was swinging toward me. Then I understood the significance of the sign of Octram-ka-listrol, about which we have been so curious, and I knew that these were the gods of the Ampu. Such a feeling of reverential awe came upon me that I must have felt as a pagan feels in the presence of the mystery of his gods.

"'It was with an effort that I shook from myself that feeling of dreadful worship and persuaded myself that these were nothing but natural phenomena which none of our race had seen before, and as such it was a duty to try to record and remember their significant features. I noticed that the spheres were of two classes. When one sort passed, a feeling of lightness came upon me, almost as though I were being thrust away from the floor upon which I was lying. When the other sort passed, it seemed as though my body had become enormously heavy, and in fact I was conscious of being thrust, painfully, against the floor. I feel sure that in this unsuspected internal mechanism of the earth lies the answer to electrical phenomena as well as gravity, of both of which the Ampu seem to understand the control.

"'I knew that hours had passed before I thought of Keraub, and when I found her near where I had left the lofet, I thought at first that she was dead. After she had somewhat recovered her composure, I asked her many questions. She told me that there were eight of the great spheres, four on each of the two orbits which intersect at what, I should think, corresponds with our north and south pole. There was the ninth or central sphere which they never represented in their figures and whose name was never uttered except by the high priest.

"'As nearly as I could figure, the orbits swing from east to west, or in the opposite direction from the revolution of the earth. Whether these revolutions retard the rotation of the earth is for our scientists to prove, but I should think that at least they would create a new theory of the tides. And that small eccentric swing at the poles, which I feel convinced is where the intersection of the orbits occur, would account for the shifting of the magnetic pole.

"'I wonder why our scientists have never arrived at the correct theory of the internal mechanism of the earth. They argue and theorize a great deal by analogy, yet, although they conceive of the atom with its electrons and protons as being analogous to the universe with its suns and planets, they must conceive of the earth, an

intermediate thing, as being constructed upon a totally different plan, when they claim that nature works upon a definite plan. Of course,' he added, 'it is not for me to criticize our men of great learning, but why should not the phenomena upon which they base their calculations be produced by these unrealized forces as well as by density or mass.

"'Oh! Joe,' he said with great feeling, 'if only I were trained as a scientist is trained, instead of being only a poor, ignorant mud pusher—but the time will come when even the poorest of men will have the advantages of education.

"I expressed a wish to see this wonderful sight, but did not realize how soon, nor under what terrible conditions I was to see the most wonderful thing that man has ever dreamed of.

"We decided to say nothing to Jim about John's adventure, for he seemed on mischief bent and was beyond reason or management.

Disaster

"SOON after John's adventure there began to be more than usual activity among the Ampu, and we found that they were preparing for the periodic festival of Octram-ka-listrol, which took place about once in every fourteen months. The radical section of the council meanwhile had made no definite move in regard to stimulating the Ampu, and we found that they had been waiting until after the festival, because at that time they expected the matriarch and patriarch to abdicate. Onslath, the leader of the radical element, would then automatically become the patriarch and the new order of things could be instituted with less trouble, the patriarch's word being final in all things affecting the welfare of the Ampu.

"At last the eve of the festival arrived, when everyone left for the great temple. We were informed that we were to attend. As all the lofets available would make many trips before all could be assembled at the temple, we found that the Ampu were camping in the caverns surrounding the temple, for none were allowed to enter until the festival commenced.

"The hour arrived and there was an eager expectancy among the assembled Ampu. From a great grilled gateway, composed of precious metals, came the music of a great choir. We had, in all our stay among the Ampu, never heard a note of music before and thought they had no knowledge of harmony, but it seems that all harmony is the prerogative of the gods. As the music commenced, everyone made that strange salute, then the gates swung backward and all slowly entered. Never, in all that I had seen below ground, had I dreamed of so vast and lofty a cavern; unlike the other caverns which had been left more or less in their natural state, this one had every inch of its walls, its pillars and vaulted ceiling wrought in intricate and beautiful designs of carving, painting and overlay of precious metals. There was room in its vast area for all the nation of the Ampu.

"At the far end, which was very far away, was stationed the great choir—the priestly attendants of the temple, who dwelt apart from all other Ampu, and whose principal duty was the worship of the gods and care of the great batteries and machines which supplied power to all that cavernous domain.

"'The choir chanted, steadily and melodiously, until all were assembled and stationary; then I saw that the vast floor was composed entirely of that wonderful crystal, of which John had spoken, with a strange light glowing through it and lighting, weirdly, all that vast cavern. We were well to the front, near a large metallic pedestal, in front of the choir.

"An Ampu, of magnificent presence, stood at the side of the pedestal. He bore in his hand a staff or sceptre, at the end of which, though detached from it, was the insignia of the gods, the eight spheres swinging on their two orbits in their perpetual round—I have never learned by what mechanism, physical law or necromancy.

"The High Priest chanted a melodious litany and as it ended, he signaled to Jim with his sceptre and invited him to take his stand upon the metallic pedestal or altar. It seems that this altar was directly over the intersection of the orbits of the spheres. The intersection corresponded exactly with the altar once in fourteen months. Jim was nothing loath and advanced with a grin; he was a strange figure, with his long, flowing, fiery red hair and bushy, ruddy beard and ragged clothes, standing there above and in full sight of all that assembly.

"He caught my eye as he looked around with an amused smile and made a gesture of ridicule, which I in nowise answered, for from the moment I had entered the temple I had had a premonition of disaster.

"Suddenly all was hushed and still. From a distance there came a faintly harmonious, yet thunderous sound, which increased rapidly in volume as the moments sped. And then, under the crystal floor, there came into view one of the gigantic spheres, rolling forth that strange, thunderous music of its own. It passed rapidly while I stood gazing down upon it in awe; then it passed beneath the altar and, as it did so, I was conscious of a faint hiss. I looked up, thinking that Jim was still trying to be facetious, even in the presence of that awesome sight, but where he had stood was nothing but a slight, tenuous column of dust like the frail wraith of the man who had stood there but a moment before and which slowly settled to the top of the altar—the first sacrifice of the festival.

"For the first time in my life I fainted and fell prone upon the crystal floor. I woke again to consciousness to find John and Keraub solicitously attending me. They raised me to my feet, and Labvo came and put his arm around my shoulder to comfort and support me. Poor John was not in much better case. Keraub and Tora, like the good friends they were, were doing what they could to comfort him, but I caught sight of the face of Ishtu leering maliciously at us from behind a pillar.

"The music of the choir rolled forth again, and at last came the litany of the High Priest once more. My curiosity overcame me and I looked up to see who the next victims would be. Then I saw the ancient patriarch and matriarch step forward feebly, with beatific smiles upon their faces. They waved aside the offer of assistance which the High Priest tendered and, hand in hand, tottered up the steps of the shining altar. There they stood, calmly waiting, making the sacred salute, as the second sphere was heard coming near. Then, with hands extended in benediction over the assembly, which they had so long governed, they too returned to the dust from which they came.

"'A voluntary sacrifice and acceptable to the gods,' I heard Labvo murmur.

"For twenty-four hours we stayed in the temple, while

the festival went on. Eight sacrifices and nine victims, some voluntary and some paying the penalty of neglected duty—the only capital crime among them.

"We heard the temple gates clang shut behind us, closed fast for fourteen months before anyone but the priestly brotherhood would look again upon the Dwelling of the Gods.

"When we had returned, in a chastened mood, to the communal cavern, we found the Ampu assembled in knots and groups, and from snatches of conversation which we overheard, we found that the execution of Jim was not unanimously popular. We took no part in the many debates, for as John said, it looked as if his trouble-making spirit survived.

"Gradually the Ampu drew into two distinct groups, from which first one then another would step forth in animated argument. They seemed, at last, to be aroused from their age-long lethargy. Presently two from opposite sides tried to talk at the same time, and in a few moments they were fighting, striking, kicking, biting and wrestling. It was the most vigorous action I had ever seen among them.

"Ishtu, who was in the forefront of one group, screaming like a virago, suddenly screamed, 'The kusoms, the kusoms!' and in an instant there was a milling, fighting mob struggling to get to where those deadly instruments were kept. The council, pleading, tried to stop them, but being mostly old men and women, were quickly overborne and trampled upon.

"Keraub caught John by the arm and began to drag him away. 'Come,' she said, 'or they will kill you.'

"We three fled together. When we reached the first lofet, I looked back and saw that the kusoms were already in play, doing their deadly work. With such weapons, no battle could last long.

"We fled through the tunnels and caverns at tremendous speed, and presently I thought I heard a sound behind us. 'They are coming,' said Keraub, 'but, oh, if we could only reach the crystalline stratum! The kusom has no power beyond that.' Then the power in the lofet died.

" 'Come,' said Keraub, 'we must leave the lofet and go on foot. It is not far now. Octram-ka-listrol grant that they have not the cherosom, for that is more deadly and powerful than the kusom and can be used beyond the crystalline stratum.' She seemed to be in a very hysteria of fear.

"I was swifter of foot than Keraub or John, so I ran ahead of them. 'Come on,' I called as I caught the gleam of the crystals in my torchlight. 'Here it is.'

"I turned as I entered the crystal cavern, and at that moment I heard Keraub, with a low moan, stumble and fall. I turned at the sound and saw John stoop and gather her into his arms and come at a stumbling run toward me. Before I could make a step toward them to help, I saw the evil face of Ishtu, convulsed with all passion, at the turn of the tunnel; she raised the kusom and in a flash Keraub, as she would have wished, died in the arms of John. He crumbled with her, so that their dust lies mingled together far below ground. At the last, I think, that would have been John's wish, too.

"Knowing that I could do nothing for them, I turned and ran, sobbing and cursing, through the cavern. As I ran, I looked back and saw Ishtu aiming the kusom at me. Instinctively I sprang behind a pillar, but sprang too far, so that from the other side I saw Ishtu crumble and dissolve. The invisible ray had struck the crystal pillar and been reflected, so that it killed the killer.

"I could hear others coming on, but could tell by the sound that I was outstripping them, so that at a turn as I left a cavern I paused to listen and look back. It was then I saw my salvation. Just above where my hand rested on the wall, I saw one of those arrow marks which John had made nearly three years before.

"I ran steadily now with the light of my torch to aid me, searching at each turn for the blessed arrow mark. I was running as I had never run before, uphill though it was, and feeling that, through exhaustion, each step would be my last. But fear kept me moving. At last, ahead, I saw a dull gleam of light. I stumbled and fell and the torch was crushed under me. But that dull gleam of light was as hope renewed. I staggered into it and dived and swam as I never had before, and then rose to the surface into the dazzling light of the blessed sun, but blinded by its terrible rays. I floated on the current and at last felt something brush my shoulder. I turned, struggling against the current, and then grasped the branch of a tree. I pulled myself up the river bank and collapsed in the road, where Mr. Hamilton found me."

DURING the last part of Joe Everett's recital Professor Small had been walking to and fro excitedly, making an occasional remark. A minute or two after Joe finished, the Professor suddenly said, "You'd better get our friend to bed," and I saw then that he was sleeping the sleep of exhaustion where he sat.

Professor Small refused to go to bed, but continued to walk to and fro in the house and finally out upon the lawn, where he continued to pace in deep thought. There was very little sleep for me that night, for soon after daylight he was knocking on my door and calling me to get up.

"Here," he said, thrusting the morning paper, which had just arrived, into my hand, "is something that will confirm our friend's story."

There, in bold type, was the startling headline: *Strange Subsidence of the Earth.*

A very large and deep pit, so the item continued, had formed in the earth about six miles from our home, and another and very much larger subsidence was noticed not more than four miles from the first. The usual comments and suggestions of earthquakes and abandoned mines followed.

When I had finished reading, the Professor said, "Well, William, the troglodytes decided to cut off all communication with the surface and the mystery of the earth will remain a mystery for a long, long time, except for what Joe Everett has told us."

Professor Small is soon to deliver a lecture before a gathering of scientists, at which Joe Everett is to be present. The title will be "The revelations of Joseph Everett regarding the inner structure of the earth and its internal mechanism, with their possible relation to unexplained phenomena."

With the assistance of Joe, I am preparing notes for the Professor's new book, which is to be published at an early date, the theme to be "Tangential Evolution."

THE END

The Passing Star

MOST of us, at some time or other, have seen "shooting stars" fall from the heavens. These are minute planetoids, drawn out of their orbits by our earth. Suppose a great star from "outside" should come into the solar system? As far as we know, this has never happened, but it does not necessarily follow that it would be well to forever ignore such possibilities. What if the one chance in a billion should come sooner, instead of later? Read what the author of "The Conquest of the Earth" has to say about such an unexpected turn in cosmic events, in this fascinating story of absorbing interest and scientific importance.

"IF one could turn backward the inexorable march of time, as one would unroll a cinema film, back to an inconceivably remote period of time some ten billions of years ago, and like a god could review the cosmic drama of that little bit of the universe, in which our world began its existence, he would see an utterly different strange state of things. If with infinite time to spare, such a one could take up a station, from which to behold the unfolding cosmic panorama of that far period when our Solar System had its beginning, he would have to take station far out over the present system, far from the sun, in order to obtain a comprehensive view of the cosmic births as they would take place.

"Taking up his station, and with breathless interest speeding up the passage of time, this hypothetical being would behold our sun swelled to immense proportions, a flaming mass of incandescent matter moving rapidly through space. He would look in vain for our earth and its companion the moon, or the other planets. And if he looked away and cast his gaze into far-off space, he would see a star, flaming like our sun, immensely far, but its disk plainly visible. He would see this other sun approaching ever closer in its brilliance rivaling ours, and rushing headlong by in an opposite direction, passing our sun as one ship passes another in the night.

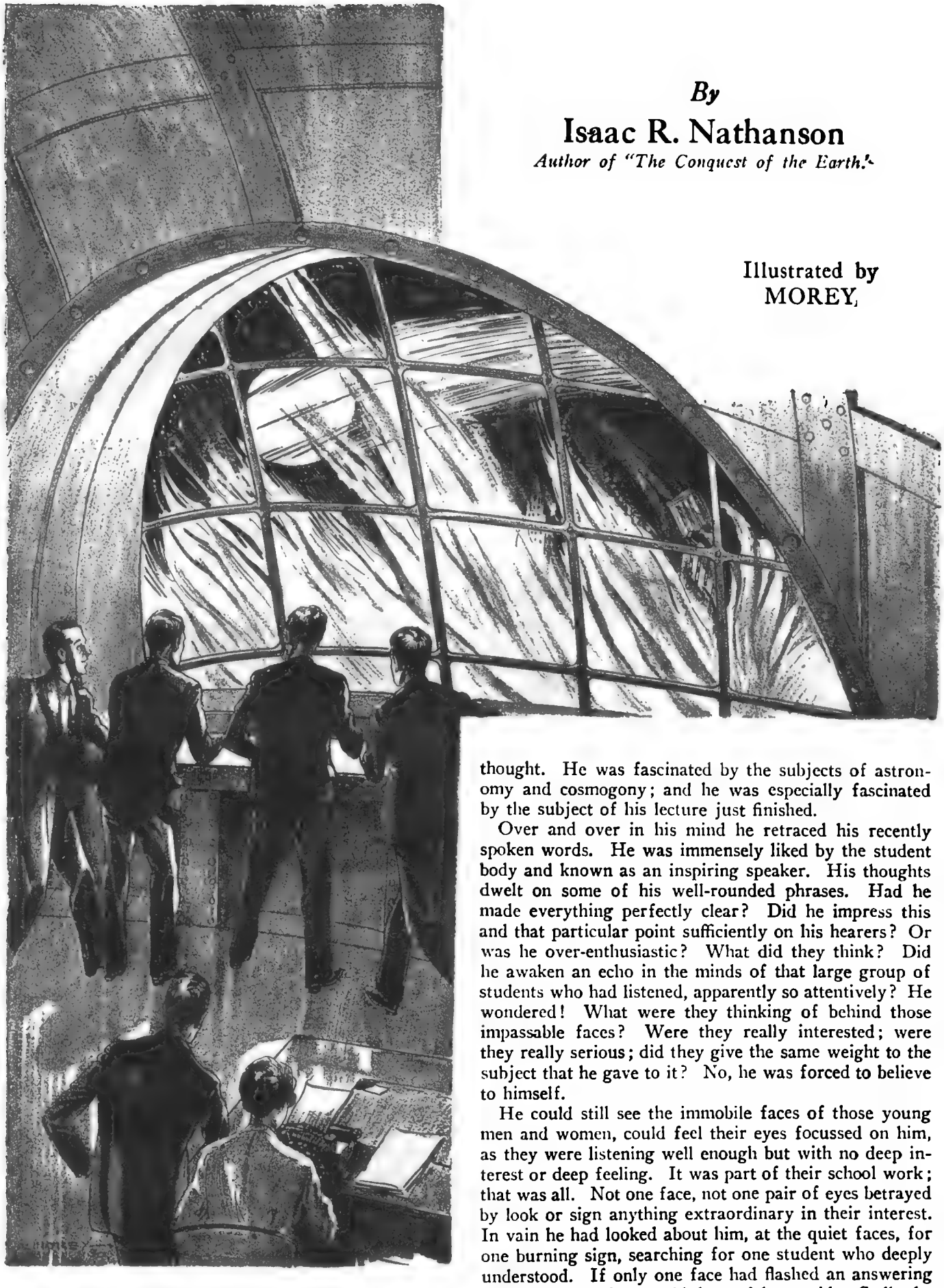
"As our god-like beholder looked, fascinated, he would see the vast bulk of our sun pulled into an elongated sphere, the raising of tremendous tides; he would see frightful solar storms and huge eruptions on a cosmic scale beyond the ken of mortal eye. Suddenly one of these mighty tidal eruptions, combined with the great disruptive forces within the sun—evidenced by the disruptive prominences still occurring at the present time—growing ever more violent, caused enormous prominences to shoot out with a fearful explosion, out, out into far-off space at a speed which carried the flaming mass of matter toward the other star beyond the sun's recall; while from the opposite side of his bulging body and at the same time, another tidal mass was hurled forth—and Neptune and Uranus were born. Then as the tidal pull of the passing star continued, with appalling disturbances, and at its closest approach to our luminary, two more oppositely directed eruptions took place—and beautiful Saturn and mighty Jupiter came into being. Two more eruptions followed, of much lesser force; finally followed by two more—the last; and Mars and Earth, Venus and Mercury were born in the lap of time.

"And then, as our observer stood and looked, these immense detached arms, although small as compared to the main body of the sun, appearing at first as long knotted spirals attached to the parent body and turning in the direction of the passing star, would gradually take on the spherical form of our planets. And thus before his eye the Solar System took the form, much as we know it now.

"As a ship that passes on, our beholder saw the passing star recede, and grow ever more dim in the remote fastnessess of space. But its mission of cosmic cross-fertilization, its parental influence in causing our sun to give birth to our family of planets was accomplished. And millions and millions of years rolled by—billions of years; and still such a one would see not a sign of the promised life to come on that little speck we call our earth. And though he unrolled the entire roll of time clear to our own epoch, never again would he see another star approach our sun so closely as in that abysmally remote time, so long, long ago."

THE lecturer had finished. His youthful face was flushed, his eyes feverishly bright. His subject had been on cosmogony and the origin of the earth, as propounded by Jeans, and particularly on the "Planetesimal Hypothesis" of Chamberlin and Moulton. The closing sentences were spoken in low intense tones, gradually dying out in a dramatic silence that seemed to disappear into the very walls of the lecture room. A few seconds of quiet, as if the listeners were both to leave, and then everyone scattered.

For a long time the young lecturer, an enthusiastic instructor in the science of astronomy, remained motionless at his desk, deeply absorbed in thought. Dr. Bernard Daily was one of those thinkers who could not think coldly and dispassionately. He felt what he



Dr. Daily and a number of his friends and colleagues stood in his observation tower until the last possible moment, observing and taking notes.

By

Isaac R. Nathanson

Author of "The Conquest of the Earth."

Illustrated by MOREY

thought. He was fascinated by the subjects of astronomy and cosmogony; and he was especially fascinated by the subject of his lecture just finished.

Over and over in his mind he retraced his recently spoken words. He was immensely liked by the student body and known as an inspiring speaker. His thoughts dwelt on some of his well-rounded phrases. Had he made everything perfectly clear? Did he impress this and that particular point sufficiently on his hearers? Or was he over-enthusiastic? What did they think? Did he awaken an echo in the minds of that large group of students who had listened, apparently so attentively? He wondered! What were they thinking of behind those impassable faces? Were they really interested; were they really serious; did they give the same weight to the subject that he gave to it? No, he was forced to believe to himself.

He could still see the immobile faces of those young men and women, could feel their eyes focussed on him, as they were listening well enough but with no deep interest or deep feeling. It was part of their school work; that was all. Not one face, not one pair of eyes betrayed by look or sign anything extraordinary in their interest. In vain he had looked about him, at the quiet faces, for one burning sign, searching for one student who deeply understood. If only one face had flashed an answering understanding, he would have felt repaid. Sadly he shook his head. These, to him, transcendentally interesting subjects were but temporary with them. The

round of their daily amusements, their school sports and social life—these were the things that really mattered to them. Everything else was at the best but a temporary escape from boredom. It was his marvelous gift of oratory which had held them; they were listening more to the pleasing sound of his voice and well chosen words than to anything else. The vast deep thoughts to which his words gave voice, their permanent significance—what did that mean to them? Out of the classroom, out of mind.

Sadly his thoughts turned to his own life; the past and present. His widowed mother, slaving and sacrificing, his youthful, sensitive school years, burning with the passion for seeing and understanding. Then came his student days at the university, his wretched poverty, his self-denial; the working at odd jobs, serving at table, often going without breakfast in order to have just enough to carry through; while all the time his soul was on fire with suppressed desires, unbounded ambition. Then came a scholarship, meager but sufficient with strict self-denial. The day of graduation came; the coveted diploma was in his hand. With what trepidation and misgiving he had faced the end of his college work. Would he get a position; where would he get placed, would he get placed at all? There were not many places in his chosen field. Besides he was so impractical and unworldly. He had written many applications with no result, and was in despair. How anxiously he had awaited the answer to one particular application. They had asked him to include his photograph! As if that should have mattered. Were they selecting instructors for their faces? What had that to do with the teaching ability and knowledge of the applicant? Did the world choose Shakespeare or Newton or Lincoln because of their faces? How ironical and senseless it had struck him. He still remembered the rage that rose up in his heart against his fate, against those narrow-skulled men, who had the making of the minds of student youth in their unkindly hands.

With what hope and gladness he had come for an interview and was accepted. "Twelve hundred dollars the first year." After all those years of hard work! His sister at her stenographic work, easily acquired, earned more than that. It was like a dash of cold water in his face. But he could not retrace his years of school and college work, and besides he wouldn't, if he could, for he loved his science and his profession. Did his kind ever work for money? Perhaps that is why they have always been taken advantage of.

Well, what did that matter? Let the world live its own life; he would live his. In the end, who knows who would get the most out of life; his kind or those others? Who can say?

Bernard Daily went to work; he applied himself with zeal, with indefatigable interest. He had his life's work before him. He had been teaching four years at the university now. It was hard, exacting work, but he loved it. One cannot be too particular; one must make the best of everything.

He was immensely liked by his friends and colleagues. Slightly above medium height, well built, with a shock of chestnut, almost reddish, hair; grey-blue dreamy eyes that seemed to see little, yet saw everything; a smiling mouth with somewhat full lips, showing beautiful white teeth; a pleasant, kindly, scholarly face.

For a long time he sat absorbed in deep reverie brooding, dreaming, thinking. His was the type of mind that lives a large part of the waking hours subjectively, forever living in a beautiful inner world. Finally he roused himself, sighed deeply, and walked down the hall to his office, which he shared with another colleague.

For several hours he worked steadily at his desk until it grew dark. Then recollecting that he had had no evening meal, he put everything in order and went out.

It was a marvelous night, soft and balmy; the first week in June. There was no moon, and overhead the sky was ablaze with the scintillating stars. Occasionally a meteor shot its fiery streak across the firmament. He walked along, scarcely thinking of where he was going.

He was in love. This did not bring him happiness. It only made him discontented and wretched. Yes, he was in love, his whole body vibrated to the blessed feeling; charged with tender inexpressible longing. But was it to be a requited love? He hardly believed it himself. He blamed himself for encouraging his feeling. There was such a tremendous difference in their social positions. Economic barriers can be so forbidding. He reflected on his wretched income, increased from year to year, but at what a pitiful rate. His poor mother stricken with arthritis, taking so many of those hard-earned dollars. If only she could be cured.

But he was young, scarcely thirty, and the wine of exuberant life was coursing through his healthy veins. The beautiful night intoxicated him; there was so much to do, so much to live for; and as he walked and walked, breathing deeply of the balmy air deliciously laden with the perfume of growing things, his oppressive thoughts fell off him, and he thrilled to the joy of living. Happiness had been for him the illusive wisp—but he would get it yet. The dreamer!

He decided to turn his steps in the direction of Ellen Wakefield's home; forgot that his mother was waiting patiently for him, his meal growing cold. But he was not hungry anyway. And besides, a greater hunger drove him on.

She met him on the patio, in her dear gracious way. Sweet Ellen. Lithe and graceful, suffused with the inimitable bloom of youth, which nothing can replace. Four and twenty years lent a charming air of self-possession. She had an adorable way of throwing up her little well-shaped head in greeting. Her voice was clear and musical.

"Well, what brings you here this evening?" There was a gentle banter in her tone. She delighted in teasing him.

He reddened slightly. Their first greetings always made him feel like a big boy, but his shyness quickly disappeared.

"Not much to do, so just dropped in for a chat," he answered.

"But there are so many stars out this evening, such a wonderful night for study," she bantered.

"There are two shining orbs before me, which I prefer to look at just now." He looked at her ardently.

"I was speaking only of heavenly ones."

"So was I. Come, let us take a stroll."

They walked along in silence for some time. With a woman's divination, she saw and understood perfectly his hidden feelings for her; but, with an equally subtle, womanly way, she obscured her true feelings from him, so that he was never sure. He was enthralled in her

company, yet ill at ease. Her slightest touch thrilled him, yet he was vaguely troubled by her self-possessed aloofness. He could not make her out. He did not dare assume anything more than an attitude of friendly distance.

In a quiet spot of her estate, they sat down. They felt each other's presence like a burning aura.

"Tell me about your day's work," she urged. "Did you lecture today; and what was the subject? I'd love to hear about it."

He needed no urging. The young astronomer was always ready to discourse on his favorite theme. Particularly to Ellen. He went over the main parts of his lecture, and as he spoke he grew more and more intense, as was usual with him. She listened silently and attentively, interrupting him here and there with a question. When he had finished describing the hypothetical origin of our Solar System, on which he had lectured, she asked him:

"What is there to prevent another star from passing close to our system once more; and what would happen if such a thing came to pass?"

"Nothing to prevent it," he answered. "It is a rare cosmic event, entirely within the realm of possibility; but not in our time, or as far as one can tell, for ages upon ages to come. Even the nearest star known, Alpha Centauri, in the southern hemisphere, is entirely too far away; in fact, so far away, that its light traveling at the inconceivable speed of over 186,000 miles a second, takes four and a third years to reach our earth. At the ordinary speeds at which celestial bodies move, Alpha Centauri, even if it did move in our direction, which it does not, would never reach us in a thousand generations. The chances of two stars colliding, or even of a close approach, sufficient to exert a direct influence on each other, are exceedingly rare in siderial space, although not impossible. Most likely the novae, or new stars, are the result of such catastrophes, causing them to blaze out so suddenly. But this occurrence is so rare that the average law of chances renders such a possibility very slight—in fact, only once in about ten billions of years. Sufficiently rare for our future generations to carry on undisturbed," he smilingly added.

"No, our sun and his family are so far removed from any outside body likely to produce disturbance, that we are practically alone in the depths of space. And although in the infinitude of space there exist millions and billions and trillions of bodies inconceivably large and inconceivably small, yet space is nearly empty, its flaming suns but far and scattered pinpoints in an endless void; and each pinpoint removed so far from each other as to be totally isolated."

BERNARD left Ellen late that evening, his heart hungry as ever, but with an unexplainable happy feeling. His research work took him to the observatory, where, throughout the long night he would sweep the unfathomable reaches of the sky with the great telescope at his disposal. Here he was in his element; and he soon lost himself in his work. Photography, spectroscopical analysis, complicated mathematical computations left no room for other thought. The work was joy to him.

He turned to study a certain faint star which puzzled him. For some time past this star had been under his observation. Careful study of stellar charts and photographs had indicated an unexplained sudden increase in its apparent brightness, small but considerable, as stellar magnitude goes.

As the night drew to a close, he was comparing a spectroscopic photograph of this star with an identical one taken previously, and which he had not examined before. The reader is no doubt acquainted with the meaning of the shifting bands of light as revealed in the spectroscope. In addition to revealing the elements existing in the body under observation, the spectrum with the Frannhofer lines indicates the velocity of the body, and whether it is approaching or receding from the observer.

Casually Dr. Daily took the two spectographs and began to compare them. He was not quite satisfied. He attached his spectroscope to the great refractor. As he studied intently, he gave a sudden start. With a tense interest he looked again. Could there be some mistake? No. He himself had most carefully and with the utmost precision set the apparatus. Everything was accurate to an infinitesimal degree; of that he was sure. The spectroscopic analysis of this very faint star clearly indicated that it was approaching the earth at the unheard of velocity of over 1100 kilometers, or about 700 miles a second—a 'runaway' star! He could scarcely believe his eyes. How was it that it had escaped detection before? Surely there must be some mistake.

It was approaching day, and he quit further work. He went home, his mind aflame with his discovery. Eleven hundred kilometers a second! His discovery, if true, would create a furor in the scientific world. He could scarcely wait till the following night to resume his work.

When the time came he was at his post in the observatory, eagerly going over his work. He turned the telescope on that sector of the sky in a hunt for that speck of a star, at the precise spot indicated in his charts. He set about taking over again a new set of spectrographs with infinite care and precision. Only a limited number of the faint stars had ever been spectroscopically examined, and this particular one was not one of those, or he would have heard of its enormous radial velocity.

It took all night to get a clear imprint of the star's spectrum, so faint was the light. And he had to wait till the end of the following night for a companion photograph and other verifications. Eagerly he scanned the result. There could now be no doubt about it. He was dumbfounded. He brought all his skill and knowledge, which were of a high order, to bear on the subject. Prematurely announced, such a stellar velocity, unless indisputably verified by all the scientific means at his command, would only spell ridicule and loss of prestige. He must tell no one for the present; but he confided his discovery to Ellen, with whom he discussed the unusual phenomenon.

The parallax of this faint star had never been determined. And Dr. Daily's minute study of the star charts failed to show appreciable proper motion, or translation across the line of sight. So he set himself to the difficult task of measuring the distance of the approaching star, the better to make sure of its rate of movement. The astronomical computations involved were exhausting in the extreme, and would take lots of time. He did not think of his discovery as anything more than a sidereal freak, an interesting discovery to announce, the fastest star on record, of no possible material consequence to the world.

After weeks and weeks of hard labor, and with every means at his command, he finally succeeded in measuring the distance, of this runaway star. When he held the result in his hand, his heart gave a great leap. He was almost frightened by the revelation. This star, so faint as to be scarcely visible, was only a mere four hundred billion miles away. It was a small star, as stars go, about one-fourth the size of our sun; but at the rate it was approaching the Solar System, it would arrive within close proximity in about sixteen years. Preposterous! He must go over his figures once more. If true, the consequences to life on earth were unforeseeable. This almost infinitely rare event, the close approach of two stars—had the law of averages in the case if our sun struck the fatal gong once more?

THREE months afterwards Dr. Bernard Daily announced his famous discovery to an incredulous world. Over and over again his great mathematical genius had verified his first startling discovery. He was absolutely positive.

His announcement, couched in clear scientific terms, backed up with a wealth of mathematical calculations which only the initiate with a large amount of study could understand, brought before a startled world the imminence of a cosmic disaster to our earth in the not very distant future—a mere sixteen years away. A huge, flaming body, a star smaller than our sun, but over 300,000 times the size of the earth, was hurtling toward our system at a frightful velocity. And after allowing the largest possible margin of error in his calculations, it must approach within a comparatively few million miles; in fact, if it did not actually collide, would pass right through our Solar System. Visible now, in a few years it would all too soon become the most brilliant star in the heavens, growing ever closer and brighter, until its close approach would scorch the earth with its deadly heat if it did not totally annihilate it and create terrestrial and solar disturbances, the magnitude of which no mortal mind could foretell.

That these disturbances would be great and destructive, Dr. Daily was sure. There might be immense, engulfing tides, terrific earthquakes, destroying heat, appalling gravitational and electrical disturbances, not to mention unknown, perhaps fatal, magnetic storms and irradiations from the conflicting sun and the star—quite possibly actual collision and total annihilation. He counseled the entire world to drop every human activity and commence the immediate construction of vast, deep underground chambers, enormously reinforced, and sufficient to house humanity and their immediate and future necessities. So that if spared utter destruction, humanity should have the chance of saving themselves from the consuming heat and other destructive forces by taking refuge at the crucial time within these places prepared beforehand. For such a titanic undertaking there was none too much time; otherwise, assuredly, the end of the world would come. He closed with an urgent appeal to all.

The first shock of his published announcement, to which the newspapers gave scary headlines, combined with facetious subheadings, imparting to the announcement a ridiculous light, was followed by a number of withering criticisms from the more erudite quarters; and then was promptly forgotten. "Just a young professor seeking notoriety by yellow journal methods." "Unworthy of a so-called scientist." "An impossible happening." "A visionary's bad dream." Such were some of the comments on Dr. Daily's epochal announcement. It furnished an excellent theme for witty epigrams and funny cartoons. And the man in the street found good-natured amusement and evolved many jokes on the subject.

Dr. Bernard Daily was deeply hurt. Convinced as he was of the accuracy of his prediction, he was infuriated by the senseless daily drivel of the public, which prevented a serious view of his enormously important announcement. He smarted from the public scoffs and sneers; and worse still, it was all taken as a huge joke. True, he was unknown. A well-known authority might perhaps have received a respectful hearing. Even his colleagues in the astronomical world smiled indulgently and took no immediate pains to verify his figures. That was what hurt most. It was entirely opposed to all their knowledge. How expect them to take such a view seriously? It would take lots of work to verify his figures, and "they had no time for foolishness." Some generously granted his good faith. "Just the premature announcement of an over-enthusiastic young astronomer."

Great discoveries have often suffered a like fate, and before the general acceptance, like as not have broken the heart of the originator. With many of our most far-reaching ideas, it has almost seemed as if generation upon generation tried their level best not to see them, until the divining rod of genius pointed the way—then everybody absorbs them. For strange as it may seem, the obvious is often overlooked.

The temporary stir that the warning announcement caused soon disappeared. Our youthful astronomer, unknown and unsupported, felt very bitter about it. Well, they would soon, all too soon, find out for themselves. He dwelt with malicious glee at the discomfiture of his scoffing critics when the truth would finally come out. Another year, or two at the most. The star was approaching rapidly. Any competent astronomer could verify that, if he would only take the trouble; and it would not be long before it changed greatly in apparent brightness. Then the astronomical world would pounce upon it and redeem his outraged prestige.

BUT there was one person who did believe in him and his discovery. Ellen would have believed anything he told her.

The Wakefields were an enormously wealthy family. Ellen's father died two years ago, and her brother, having an immense business of his own to take care of, left the directorship of her father's far-flung enterprises to her. And well she did her job, for one so young. She was her father's daughter unmistakably and she managed to keep a firm grasp on the helm.

She had given up the insipid round of petty social activities to which her daily life had been bound as if with invisible strings. She became bored with the daily frivolities, the small talk, the pretense of straining after useful activities in arts and charities. She had tired of the men of her circle, with their egoistic chattering about themselves and their affairs, their veiled bragging. Well she knew what occupied the minds of these worthy young men; their business, their sports, their insatiable search for pleasure to escape the boredom of idle hours. They wanted her. They laid themselves and their worldly possessions, by which they set so much store, at her feet.

She had met Bern Daily at some university affair. From the very first she had been impressed with his rare personality, his shy, gentle manner. He was so utterly different. There was something about him, something about his vaguely dreaming eyes, burning with subdued fire, which drew her to him. He seemed to be interested in everything but himself. And when he spoke his eyes gradually lost their dreamy look, and flashed and sparkled, revealing his racing thoughts and burning enthusiasms. Ellen had never met anyone like him before; it was as if one were coming up with a colorful, invigorating mountain stream, whose waters flash and tumble gorgeously by.

She knew of his financial limitations, but in her wise little head she also knew of his spiritual illimitability. She was head over heels in love with him. And in her calm, determined way, she set about leading him cleverly and unobtrusively straight along the path she planned—to her heart. It did not take long to make sure of him, but she wanted to make sure of herself too.

It was a beautiful day in midsummer, and Ellen was waiting for Bern's arrival. They had planned a picnic among the hills. When he came up they shook hands; she could not control a slight blush, and averted her face. She was nettled with herself; he was the only person who could make her blush. "Dear, how stupid," she thought—"wonder if he saw anything?"

They drove away, delighted and happy. Occasionally she stole a sidelong glance at her companion. They spoke very little; they were under a spell. Presently arrived at their destination, they alighted and went afoot.

"Have you been studying your approaching star?" she asked.

"I have it under my daily observation. It is coming constantly nearer, at about a five degree angle to the plane of the ecliptic. In about two more months it should become decidedly visible to the naked eye."

"Has anyone else made the same observation?"

"Not that I know of. But they will soon; they cannot help it. I should not be surprised if announcements came from several quarters any day."

"What I cannot understand," she remarked, "is why no one has taken the trouble to check up on you?"

"I am obscure and unknown," he answered. "And I admit my discovery has a great deal of the bizarre and appearance of the unreal about it. It is entirely against all former experience and direct knowledge. If this approaching star were moving tangentially to our system, its unprecedented proper motion would have been detected on the star charts perhaps long before this; but its movement is directly in our line of sight, and not easily detected at its great distance unless studied spectroscopically; and, of course, extremely few of the stars have been thoroughly studied and analyzed, and their distance determined. It is a laborious, generally an impossible task. Had I merely declared its excessive velocity, beyond being interesting, nothing especially would have been thought of it, because there are known to be a number of 'runaway' stars. But my definite insistence that this particular star is so comparatively close and headed straight for a possible head-on collision, along with what seemed like fantastic urgings to honeycomb the earth with expensive shelters—all this was too much for them. Therefore, nobody bothers about it. History is full of the world refusing to accept a radical discovery until long afterward, or until it is forced upon it. The resistance to new ideas is simply immense."

He continued: "Yes, right down to this very day, our most epochal discoveries had to fight for their life to see the dawn of day. Many marvelous things, commonplace today, were reviled and spat upon yesterday, as it were. Why, one still hears of good people deciding evolution with the ballot—and the voters are similarly serious about it."

"Tell me, Bern: do you still think the coming danger fatal?"

"If not fatal, certainly very serious. I have no doubt of it," he answered.

"Somehow, it doesn't seem right," she said. "This beautiful world, life, civilization, the ages-old efforts of mankind—that everything could come to nothing. Surely, there must be something——"

"But the universe does not work that way, Ellen. The forces of existence are blind and purposeless. Purpose, feeling and thinking are but animal attributes—human if you prefer. Any other concept is inevitably human and has no basis in fact. If man has existed thus far on this good old earth, it has just been his good fortune. The immensities of the Cosmos do not consult him as to his destiny."

"And these shelters you recommend: would they be effective; would we be justified in such colossal undertakings?"

"Yes. Unless we are irresistibly overwhelmed, they would at least give mankind a fighting chance for life."

For a long time they remained silent, resting on a projecting ledge, and watching the setting sun dip behind the hills. They were sitting close to each other, their shoulders almost touching, looking straight ahead. He leaned slightly sideways, their shoulders touched. A delicious thrill went through their bodies. She leaned ever so slightly toward him, and felt his arm circling around, his warm hand resting on her arm. Gently he drew her to him. She rested her head on his shoulder; their faces touched; a long ecstatic kiss. Two hearts, two souls were united.

A FEW months later, announcements appeared in scientific journals the world over, bearing out, in the main, the observations of our young astronomer; but none of the alarmist features were expressed. The consensus of the scientific world, as expressed by the eminent American astronomer, Professor William Spencer Smith, was that there was no cause for alarm. It was true, the star in question was of the runaway kind, a so-called K-type dwarf star, and its course would bring it closer to the earth than any star had ever been. However, the margin of error was too great for accurate prediction, and the chances were that nothing would come of it. At the most, there would be magnetic disturbances, which might temporarily inconvenience radio reception and the like. There was nothing to fear. The newspapers quoted a few brief paragraphs of these observations, hidden among the mass of local news and advertisements, and few thought any more about the matter.

But our young astronomer did. His marvelously skilful eye, his skilful hand and the genius of his acute mathematical mind saw further and better and more accurately. The problems involved were of an order to tax the greatest resources of science. The exact location of one body relative to another has been solved

rigorously only in the case of two bodies. Beyond the two body problem, the mathematics become so difficult as to have proved heretofore unsolvable. And it was the supreme genius of Dr. Daily which enabled him to narrow down the limit of possible error in his calculations. Not for one moment did he doubt himself. And as time rolled by and the approaching star commenced to grow brighter and brighter, it became more and more easy for him to confirm his original findings.

The happy day came when Dr. Bernard Daily and Ellen Wakefield were married. A quiet affair solemnized at Ellen's palatial home. A three months' honeymoon followed: magnificent days, enchanting nights; two well-matched souls thrilled to each other.

Upon their return home, Dr. Daily took up his scientific career with greater enthusiasm than ever.

To lend greater opportunity to his efforts, as well as the increased dignity which it implied, Dr. Daily had greatly desired a full professorship at the university, which was not easily obtainable, regardless of innate ability. But a large endowment to the university on Ellen's part brought eventual recognition of his fitness, in the form of the coveted chair, which his mere genius would perhaps have been late in obtaining.

About this time he began to make plans for building large underground quarters, which his wife's great wealth now enabled him to do. He urged his immediate circle to do likewise, but they only smiled, and refused to share his calamitous views. They looked upon him as somewhat of a "crank," a trifle "odd."

The world went on about its business: industry, politics, international rivalry, humanity going about their humble tasks—the swarming ant heap, unaware of the crushing foot poised above it.

For æons and æons life on earth had gone on; therefore for æons and æons life would go on. Life here, in the main, and cosmically speaking, always has been sheltered and pampered from its very genesis. For millions of years from that first dim beginning in that long dissolved past, when a fortunate combination of elements and conditions joined together to start the precious plastic stuff of life on its long journey down the corridors of time, the vital spark or sparks have been protected and fostered until life has become the most commonplace thing on earth. Protoplasm, the stuff of life, the most unstable of all created things, has been able to continue and develop, increase and multiply in myriads of forms, because everything was just right for it. Atmosphere, water, narrow limits of temperature, undisturbed cosmic conditions; a complete host of other favorable factors. The greatest terrestrial catastrophes merely succeed in wiping out a small portion of the seething, swarming life on earth. Always there was enough and more than enough to carry on; until today the entire surface of the globe and the air above it is surfeited with life in some form or another; its greatest danger, the implacable struggle of one with the other.

To the masses of mankind, so it has always been; therefore, it always will be. At the crucial moment, the inexorable laws of celestial mechanics would decide everything; life or death, perhaps the very disappearance of our mother earth in a mass of flaming vapor.

SIX years had gone by. High in the northern skies a brilliant star was casting its malevolent light on the earth. It had become the most brilliant star in the heavens, outshining in brightness even the planet Venus at her brightest. And month by month it was growing perceptibly brighter.

The scientific world tardily recognized and acknowledged the dangerously near approach of the passing star, as predicted by Dr. Daily, and redeemed his wounded prestige. The new star became a subject of daily interest, and astronomy was given space in the dailies and periodicals beyond its customary obscurity.

Dr. Bernard Daily and his wife built themselves large underground quarters beneath her rich estate.

"Unless our earth is smashed to smithereens," he remarked to Ellen, "I want at least a fighting chance for myself and loved ones to survive."

"And what, in your opinion, are the greatest dangers to be feared?" Ellen asked him.

"Barring cataclysmal forces, against which no humanly possible precautions will prevail," he answered, "the things I fear most are consuming heat, engulfing tidal waves, dreadful earthquakes, and perhaps poisonous gases."

He planned their subterranean refuge at a depth of thirty feet. It was tremendously reinforced with steel and concrete, designed to withstand enormous strains and displacements. It was large, comfortable and airy, equipped with air purifiers and powerful apparatus for cooling, heating and lighting. Artesian wells, ingeniously connected, would provide an ample supply of pure water. In short, he provided all possible means of safety as well as comfort. He also built a small tower, cupola-shaped, low down over the ground, for observation purposes. This tower was connected with underground quarters and was constructed of enormously strong and insulated walls, with small glass windows of great thickness. The cost of the whole thing reached high figures; and the building operations became an object of great curiosity.

"We may only have to occupy these quarters for a few days, or perhaps for a few weeks," he remarked to Ellen, "but the great cost may well prove our salvation."

The approaching star grew steadily brighter, until its disk could be made out with any field glass. It was the first time in the experience of man that a star's actual disk could be seen. For even the nearest stars are so far away that our most powerful means are hopelessly inadequate for the human eye to see their real disk.

IT was in the year 1941, ten years after Dr. Daily first announced his discovery of the approaching star. It had now grown so bright as to cast a very hazy, pale-reddish light on moonless nights. As yet there were no disturbances felt of any appreciable kind, except that the aurora borealis was more brilliant than ever known, and astronomers detected faint irregularities in the outer planets. The world was reassured.

Many able minds, however, saw the danger. Almost every astronomer, as well as physicist, mathematician and scientist of note had long ago fully wakened to the impending disaster. They thoroughly concurred in Dr. Daily's forecasts, and were unstinted, if belated, in his praise. It is indeed a happy sign of our times that a great prophet does not always have to die to be appreciated. They joined with him in loud, ominous warnings.

But except for a few here and there, no concerted

action was taken. Everyone procrastinated. Many openly scoffed and poo-poohed the idea; while the masses at large, if they thought about it at all, shrugged their shoulders and took it for granted that if there really were great danger threatening the world, the government and other influential authorities would take the proper steps. There is something touching in the faith of the masses for their leaders and rulers. Besides, this very brilliant star was beautiful to behold. It appeared harmless enough. And many held it was not for man to meddle with nor attempt to interfere in the inscrutable ways of Providence.

Certain timid ones were frightened. And there were the superstitious, the charlatans, and the fanatics; and the religious exhorters, who loudly called on sinning humanity to repent and be saved in the next world. A few extremists gave away their meager belongings in anticipation of the coming uselessness of all things. Some comical scenes were enacted, as well as some that were pathetic, largely laughable in their childishness. There was also a noticeable increase in the number of weddings. And not a few news lines were written about the whole thing in a light and flippant tone, and the comic papers and cartoonists did not neglect this opportunity. The ability or desire to laugh is seldom neglected. Perhaps it is one of the saving graces.

And one could scarcely blame the people for their calm view of the situation. The general intelligence was far above that of the Middle Ages when the sight of a flaming comet in the heavens or an eclipse threw the populace into fear and trembling; the people were far above taking any stock in predictions of the end of the world. The rarest thing in all the heavens—the close passing of two stars—was not anything in the experience of man to fear. Besides, the building of vast underground structures sufficient to house the masses, even for a short time, was not an undertaking for individuals. Neither can the inertia, the mechanism of society, complicated and strained as it is, be easily and totally switched headlong into undertakings of such magnitude, altogether different from outside of the accustomed activities of the daily life. The dire necessity must be palpable and great, indeed.

But the ever rising insistence of the most eminent scientific authorities could no longer be ignored. The approaching body was now so near that it was possible to obtain quite accurate measurements of its size, its direction and rate of motion; and to determine within comparatively close limits the exact spot in space through which it would enter and pass the solar system. It was still over one hundred billion miles away—unbelievably close for a star. It was about 535,000 miles in diameter; and such was its hugeness that it would take over 300,000 bodies like the earth to equal its bulk. It required scarcely a scientific mind to realize what the close proximity, even for a short time of such a huge body, comparable in size and temperature to our sun, would mean. There was no room for doubt among those familiar with the technical intricacies of the problem. Allowing for all possible margins of error, the results of its approach at the very best, were uncertain and dangerous in the extreme.

These earnest, able men throughout the world urged the governmental authorities to take immediate steps toward all humanly possible means of protection. Even as it was, there was scarcely enough time to complete such vast undertakings in the short remaining period of five years.

Dr. Daily, as the guest of honor, was the principal speaker before a large intelligent audience in New York City. He passionately exhorted everyone to take immediate action. He pictured in lurid terms the possible consequence of the coming event, and the dreadful penalties of further delay.

But such is the perversity of the social organism, such is the peculiarity of the human mind, such is the reliance placed on certain leaders and governmental authorities, that time dragged on, and priceless months were wasted in fruitless discussion and political wrangling.

It is a strange commentary on human nature, this blind worship of the fool who succeeds, this worship of the hands that pull the strings of industry and government. Our great educators, our profound thinkers, our great creative minds, these have very little to say when it comes to political and immediate action.

But public demand finally made itself felt. Governmental authorities and influential organizations throughout the world held gatherings to decide what action, if any, to take. Our President called a special meeting of Congress. Ways and means were debated; opinions were freely expressed; speeches clogged the Congressional records.

Some venturesome spirits suggested the conscription of wealth and labor. This was promptly hushed by influential lobbies. Many were opposed to the tremendous taxes it would bring. The cost would run into untold billions, would dislocate the entire industrial machine, they insisted. No doubt it would.

Congressman George B. Stone, of Alabama, in a great vituperative speech, which received wide publicity, violently opposed any such matters contemplated. He spoke in part as follows:

"I am utterly opposed to allowing our practical common sense to be stampeded by a lot of hair-brained visionaries and star-gazers. They had better stay at their textbooks and schoolmasters' rods. 'The shoemaker should stick to his last.' My fellow citizens: Have you any idea what such an undertaking would cost? The entire world would go bankrupt. I am uncompromisingly opposed to pouring hundreds of billions of dollars into holes underground. For a long time these theorizing, impractical schoolmasters have been predicting this calamity—and still we are here. It is a source of amazement to me, the impracticability of these scientific men, who profess to know so much; their lack of foresight and their juvenile judgment, these people with whom rests the education of our youth.

"I don't believe any such thing as they fear will ever happen. For generations our fathers lived on this good old earth, and with God's will we and our descendants will continue to do so. I am for passing a law prohibiting, under pain of severe penalty, the preaching of such things, which needlessly frighten the public."

Such expressions of opinion were given leading place in the channels of communication to allay the public anxiety. And as many judge the importance of news largely by the size of the headlines and the space allotted, the world felt soothed and assured.

However, various committees were appointed to study and investigate the possible danger, and report at another meeting of Congress. Nowhere in all the wide world was definite action decided. Perhaps no one is to blame

for vacillation under the circumstance. From the appearance of things, there did not seem any occasion for voting billions and billions. It was perhaps too much to expect the world to drop everything and rush off into such vast, costly undertakings on the advice of men, whose figures were not understood by the man in the street.

EARLY in the thirteenth year, a miniature sun illumined the nightly sky. Its tiny globe was plainly visible and dazzled the eye. The deep darkness of night had disappeared, and in its place a somber twilight brooded over the face of the earth. On clear nights, when the full moon was out, the combined light of the moon and star cast a weird, ghostly light, which dispelled the mantle of darkness, and cast an unreal reflection.

Immense spots appeared on the sun, and solar storms of great intensity were observed. One vast eruption was seen to throw out a mass of ionized gas to the height of fourteen million miles. Radio and wireless were rendered almost useless.

And then the thing happened which suddenly awoke popular fear. Overnight everyone was galvanized into action. A terrific storm, or rather, a series of storms and cyclones swept the earth with such intensity as to appall and frighten everyone. There was tremendous loss of life and property.

There was a sharp angry demand from the people everywhere. Nothing very serious as yet had happened. Very likely the star had little to do with these disasters. But everyone was thoroughly frightened. Overnight general calm and apathy turned to anxiety and alarm. Things began to move rapidly.

With the advent of calm, sunny weather, inertia turned to frenzied activity. The whole civilized world organized itself on an immense scale, building underground shelters for frightened humanity. Cost was forgotten. Woe be to anyone who henceforth interfered by word or act. Where a few years before there were only scoffs and sneers for the few far-seeing ones, now it was as much as your life was worth to oppose the common zeal. Such is the inconsistency of man.

Dr. Daily and other scientists found themselves raised to supreme eminence, and the public pathetically and helplessly looked to them for guidance and salvation.

The whole civilized world became an immense underground beehive in preparation for the dreaded event. The industrial and scientific forces of the world were now organized and geared to one purpose. In a day, as it were, the entire structure of society became adjusted to the new state of things. One would have imagined it were in preparation for some interworld war on an appalling scale. There was now not a day to spare. In fact it was extremely doubtful whether the operations could be carried through in time to succor all humanity. Too many ominous signs of approaching disaster began to make themselves felt; at first barely perceptible, but more and more in the form of unusually terrific tempests, earthquakes and electrical displays.

Contrary to many expectations, threatened humanity behaved extraordinarily well under these circumstances, giving a supreme test of its true greatness. Throughout the civilized globe order was never better, nor crime at lower ebb. People vied with one another in their efforts to alleviate suffering and in charitable work. There was more sympathy and common courtesy. And there was an enormous increase of religious devotion; places of worship were never so well attended. Instead of the reign of the beast, the kindly spirit of true man pervaded. It would altogether seem that, whereas, the man-made cataclysms of war and strife have always let loose the most wicked and cruel instincts, in this case, in the face of the frowning anger of an almighty Providence, all the forces of evil bowed their heads in humbleness and religious resignation.

The world state of mind was a strange complex. There were, of course, the superstitious people, who saw signs of good or evil omen in every breath of wind. They made the weird interpretations of the most commonplace things. They placed much store by their dreams. Then there were the fearful people, who by a strange fatality, seemed to delight in picturing the most harrowing conditions. And, of course, there were the sentimental people, who became a great annoyance to themselves and to others. Many who had not seen each other for years nor thought of one another in the slightest degree suddenly became possessed of an immense urge to become friendly. Many that had been sinned against, suddenly found themselves the objects of solicitous attention; there were outbursts of belated charity; many found it quite easy to shed copious tears on any and every occasion; and there was a tremendous attendance at all funerals. And the impecunious were glad to be relieved of all responsibility. Scoffers and fearless people there were, as always; and the mockers too; yes, and even the malicious, who secretly took a wicked delight in that their enemies and haughty superiors would all end up together without distinction. Then there were the light-hearted ones, the irrepressible spirits, who see something funny in everything, whose gaiety and mirth become at times a blessed leaven and at other times anathema. And the gloomy people, and the excitable people, the ridiculous ones and the plain foolish ones. Religion took on new significance, and many who had not seen the inside of a place of worship found themselves in frequent attendance. The ultra-religious people became legion. Indeed, many strange sects and beliefs arose during that time; many queer cults and practices appeared. And let not the reader imagine that there were no wicked beings; a certain number of evil spirits there always have been under all circumstances. Yet, the masses at large, the world as a whole, behaved remarkably well.

OBSERVERS throughout the world plotted the exact course of the passing star. It was rapidly nearing the outer confines of our system, at a slight angle to the ecliptic, and its great mass was causing great perturbations in the orbits of the outer planets, although only to a slight extent in that of the earth; Pluto in particular, our outermost planet and closest to the star, was being pulled from its normal orbit into that of an elongated ellipse.

The star would pass within 22,000,000 miles of the earth. The gladdening news was announced to a willing world, that the superhuman efforts of mankind to save itself in case of a not too close approach had not been futile and wasted. However, there was still the greatest danger to life, if not to the earth itself; and it was desperately necessary to rush the works of shelter with the greatest possible energy, to the exclusion of everything else. The world was seething with human activity.

One day Dr. Daily ran into the living room where Ellen was sitting with their two children. He was extremely excited, his face flushed, a look of perturbation on his features.

"What have you discovered now: are we doomed after all?" she asked him.

"No, we are not doomed. I believe the world will be saved." He spoke these words with great deliberation, as though he enjoyed uttering every word.

A flush of joy overspread Ellen's features, as she flew into his arms. She knew her husband too well to credit the idea that he was speaking without definite knowledge.

"But I have made a serious discovery which my calculations before overlooked. There is going to be—a dreadful collision."

"How, in what way? Have you discovered an error in your calculations after all?" she exclaimed in one breath.

"No there has been no error in my calculations. But there is going to be a fearful collision, and we are going to witness the sight and live to tell the tale."

"Bernard, I don't understand you."

"There is going to be a collision in our solar system; but our earth is going to be spared. It is the planet Jupiter which is going to receive the full force of the collision."

"And you mean——"

"I mean that I have just discovered something which somehow every observer, including myself, has overlooked. Jupiter's orbit will bring him into the path of the star, and we shall witness an appalling catastrophe. The earth will clear in safety—though not unscathed. The disturbance and strain will be great, but we shall escape total destruction."

Other observers also foresaw the same impending disaster. A strange inscrutable fate would bring the planet Jupiter, as he swung around in his orbit, directly in the way of the interlopihg star.

A great spectacle was visible in the skies on the night of July 25, 1947. The planet Jupiter and the star were in conjunction. A collision of two heavenly bodies in full sight of the human eye was being staged. People held their breath, transfixed with fascination; their eyes glued to the sky.

Closer and closer the two bodies were seen to approach; the bright planet almost lost in the dazzle of what looked like a miniature sun. The celestial tragedy was imminent. Like a huge colossus, immense Jupiter, the sun's largest son, stood astride the path of the onrushing, devouring star, as if to hurl defiance and shield with his body his weak little sister, the tiny Earth. A celestial sacrifice. Suddenly, a fearful, dazzling light, a mixture of crimson and blue-white, filled the heavens. The intensity of the light was too great for the eye to bear. There was not a sound, but a paralyzing glare, which forced one to close his eyes.

As the night wore on, the intense glare died down. The approaching star, now brighter and larger than ever, was still there, but the giant planet was snuffed out like a candle. The impact of the rushing star had reduced Jupiter to an enormous mass of flaming, incandescent vapor. Shuddering humanity had a clear vision of what a collision to our earth would be, after beholding the fate of mighty Jupiter—a planet 317 times the mass of the earth.

THE final phase of the celestial drama was now here; the final fateful days which would decide life or death. The star was approaching with frightful rapidity. At the rate it was moving, it would cross the gap of Jupiter's orbit and be at its closest approach in about eight days. Humanity waited in agonizing suspense.

An extraordinarily early spring had been followed by the hottest summer within the memory of man. The greatest solar activity ever recorded was observed. The earth was being pulled toward the star considerably out of its orbit. The strain produced resulted in cataclysmal adjustments. An appalling series of earthquakes and tempests followed one another. In many places volcanoes, long quiescent, awoke to tremendous activity, and the first real rumblings of the approaching terror struck fear into everyone's heart.

The presence of such a large, extraneous body within the confines of the solar system, moving at such high velocity, was like a revolution in the equilibrium of the whole system. Ruled over by our sun since its very genesis, laws and forces that had gone undisturbed in their clock-like regularity for billions of years, were now set at nought—like the effects of a bombshell thrown into the midst of a well-organized machine. Lucky it was the sun's mass predominated. Had the star been of almost equal mass or larger, no human knowledge could have foretold the results. As it was, cosmic disturbances were set up to an incalculable extent and the final consequences to life on earth would have to remain unknown.

The mutual attraction between our sun and the invader brought about inconceivable reactions between the two bodies. The tidal strains produced on the sun, together with its own eruptive tendencies, resulted in intense solar storms, which sent streamers far out into space, with their consequent effect on terrestrial conditions. A vastly increased radiation of ultra-violet rays from the sun as well as from the now distinctly felt rays of the star, reached the earth's surface. Without realizing it, large numbers died unexpectedly from overexposure, for an excess of these powerful rays may be inimical to life; and sharp warnings were issued to the public, counseling proper precautions. It was time to take shelter, and the masses were ordered underground in the places provided.

As the star neared its place of closest approach to the earth, the heat became unbearable. The temperature shot up and up, until the entire earth became like a fiery furnace. The proximity of the star, as well as the increased activity of the sun, produced a temperature in which nothing on the surface of the earth could live.

And our little planet, caught between the vastly larger bodies of these two opposing forces, was pulled in opposite directions as if it would be rent asunder. The fury of nature continued at an ever increasing tempo.

All day long the blazing sun poured down its pitiless heat on a burning world. The forests, vegetation, habitations, and everything that was inflammable were in one dreadful conflagration. At night there was no surcease from the burning rays. Darkness had disappeared. As the sun set, the flaming star, now looming larger in appearance than the sun, rose in the sky; at first like a huge red globe, then it rose over the horizon with a reddish-white dazzling glare. The sun by day; the star by night—there was no more night. For twenty-four

hours of the day the earth was caught, as if between two fires on a roasting-spit.

The tidal friction on the earth developed by the combined pull of the sun, the star and the moon produced a series of tides of such height and such extent, that it seemed as if the entire oceans would be pulled out of their beds to engulf the land. Ever increasing in height, as the star approached its closest, tidal waves broke over the shores of every continent, swamping and destroying coastal cities, and far inland.

Huddled in fear and trembling, with prayers on every lip, helpless humanity had sought refuge in the underground havens, which foresight had provided. There was not room for everybody. Every available foot was crowded to the limit. All activity of any kind had long since ceased; it was impossible to do anything but live and endure. There was no time to build additional quarters, and considerable numbers were forced to remain outside, to perish in the burning holocaust, and the tides drowned multitudes in the subterranean shelters.

Violent and tragic scenes were enacted. In their rage, when they found they could not find shelter in the underground places, many revenged themselves, wherever possible, on those who had opposed the building of these shelters. Rightly enough they felt they had been cheated of a chance to survive; and they made short shrift of their terror-stricken victims. Congressman George B. Stone, who had sought the underground shelters along with the rest, was discovered by his nearest neighbors; and despite his screams and entreaties, he was roughly forced outside by the mob, and his place was given to a young woman and her baby. And those that could not get in, sought whatever safety they could find in cellars and caves. But these proved pitifully inadequate when the final crisis approached.

Dr. Daily and a number of his friends and colleagues stood in his observation tower until the last possible moment, observing and taking notes. The star was at its closest approach. They knew it was passing within 22,000,000 miles of the earth, a searing, fiery mass; but it was impossible to see the sky. A great, fierce crimson glow was all that could be seen through the thick clouds which now enveloped everything.

Outside, it was like a boiling kettle. The terrific heat produced vast clouds of steam which covered the entire earth. Hurricanes, tornadoes, cyclones and wind storms blew with such destroying velocity, that buildings, trees, huge rocks and other objects flew through the air like pieces of paper. The wind force attained a velocity of nearly four hundred miles an hour, as indicated by Dr. Daily's instruments. Even steel and concrete structures were bent over and torn from their foundations. Nothing outside could live. There was one continuous crash of thunder, and lightning bolts struck the earth in a constant bombardment. A deluge of water began to pour from the skies.

It became unsafe to stay any longer in the tower, for so constant and close were these lightning discharges, so great the avalanche of blowing missiles, that at any moment the tower might be shattered, despite its enormous strength. They withdrew deep underground to await the final let-up of the furious elements.

And even the underground shelters were not altogether safe in all places. The tidal strain produced on the earth caused many settlements and faults. Such earthquakes as man had never known rocked every continent. Tremendous landslides occurred. And strong though these shelters were, a great number were crushed or rent open, and the unfortunate occupants were quickly consumed by the heat, asphyxiated by the deadly gases, or drowned by the constant cloudbursts which were inundating the earth. To add to the horror, volcanoes in many places, even in parts that had never known them, burst out with destructive violence, engulfing vast districts with molten lava and ashes; and burying many alive, who had sought shelter in the underground chambers. Many believed that the end of the world had come after all.

But mankind survived. Stored provisions, water aplenty, bearable temperature, purified air—these wisely provided in immensely strong subterranean retreats, saved nearly all from death. And adequate sanitary provision prevented disastrous epidemics. Aside from temporary personal discomforts, there was no suffering. Everything had been well organized and the retreats were well managed.

A WEEK later, Dr. Daily ascended his tower. Most of it was shattered, but one small wing was left intact; and he was able to obtain a view of the outside. The terrestrial strains and stresses had abated. Thick clouds still filled the air to the very ground, destroying all visibility. The temperature was still high, and one continuous storm raged. Tests of the air revealed poisonous gases in unsafe volume, which perhaps reached the earth from the outer fringe of the star's eruptions, as well as those belched forth from the interior of the earth by the many active volcanoes. But the worst was over.

In two weeks more it was safe to leave the underground shelters; and a relieved humanity gingerly ventured forth.

It was a changed world they beheld. Familiar landmarks were unrecognizable. Rivers had altered their courses. The incessant downpour had created many large inland seas, and tremendous washouts. Upheavals had raised veritable mountains in valleys, where level ground had been before. Land had subsided here, and risen there. A continental island appeared in the middle of the Pacific. And whole mountain chains had been split asunder, creating marvelous scenic effects, which no man could now appreciate. Vegetation and animal life, except those carefully preserved underground, were destroyed; large forest areas were still burning, filling the air with smoke. Volcanoes and continued earthquakes lent a dreadful reality to a stricken world.

And if the natural topography of the globe was so altered, the handiwork of man suffered even more. Scarcely a house or building or bridge, or other structure was left standing. The world's work in five continents, the treasures of centuries of toil, was scattered over the face of the earth like chaff. Hardly one stone was left on another. The burning temperature, the tidal waves, the overwhelming air currents driving at hundreds of miles an hour, the lightning discharges, the steady avalanche of water from the sky, the earthquakes and volcanoes, even the tidal waves caused in the rock surface, all conspired to produce the most indescribable chaos. It was a vastly great and fearful Sodom and Gomorrah on a world wide scale.

But a shattered and impoverished humanity was not

ungrateful. All were thankful to have escaped with their lives. In the face of appalling calamity the human heart grows stout, and the soul rises to supreme heights. Therein lies the test of man's true greatness.

With the star's crossing to the same side as the sun, the welcome mantle of gradually returning nights assuaged a scorched world. Blessed night. Like a cooling drink to a parched throat. Once more a thankful world began to have healing, restful night.

Gradually the skies cleared, and the world was able to take stock of itself. In far-off space, on the other side of the sun, which now shone with accustomed cheer, the receding star was now happily beyond the confines of the Solar System. One could now look without misgiving at the brilliant spectacle it still presented in the sky. Although now shorn of its brilliance by its greater distance and the rays of the sun, it still dazzled the eye, especially in the evening. But day by day it gradually lost its brilliance as it sped on into the abysmal depths of space from whence it had forced itself on an unwilling world. The mighty mass of our sun had driven it considerably from its course, and drawn it around in a large swing, which headed it in a somewhat different direction.

Once more the earth settled down to its normal existence. And yet it was not normal. A number of important changes had occurred—changes which would endure into eternity. The passing of the star had straightened the earth's axis from its obliquity by eleven degrees, thus rendering our days and nights, as well as the seasons, more nearly equal. The axial rotation had also been increased, so that our days are now swifter and shorter; and measured by the old standard—twenty-two hours and eleven minutes long. Of far-reaching importance also, was the fact that the star had pulled the orbit of the earth about a million miles further from the sun, and its tremendous passing velocity had set our planet spinning around the sun at a much greater rate, so that one revolution is now completed in three hundred and twelve days, by the old reckoning. It may, therefore, be said that man's days and years on earth have been increased. Another peculiar change of great interest is the slightly increased tilting of the plane of the ecliptic, while the moon's orbit has been displaced to a distance of 210,000 miles, bringing our satellite nearer, and more beautiful to behold. The absence of bright Jupiter and his interesting moons would, of course, be missed by all sky-loving observers; and the removal of his vast bulk would undoubtedly cause changes in the orbits of the rest of the planets, which astronomers would have to calculate and observe in the future.

For years a busy humanity was engaged in its herculean task of rehabilitation. So many far-reaching changes had taken place. It was certain that for long there would be no room or time for bickering and strife. Like a fire-swept city that is rebuilt, it was now possible to rebuild civilization on a finer and more generous scale. All the cobwebs and muck and dirt and rubbish had been swept out and destroyed, along with the semi-useful and unnecessary. The passing star proved itself not altogether an unmixed evil. A greater humanity and a vastly more splendid civilization reared itself on the ruins of the old world.

THE END

What Do You Know?

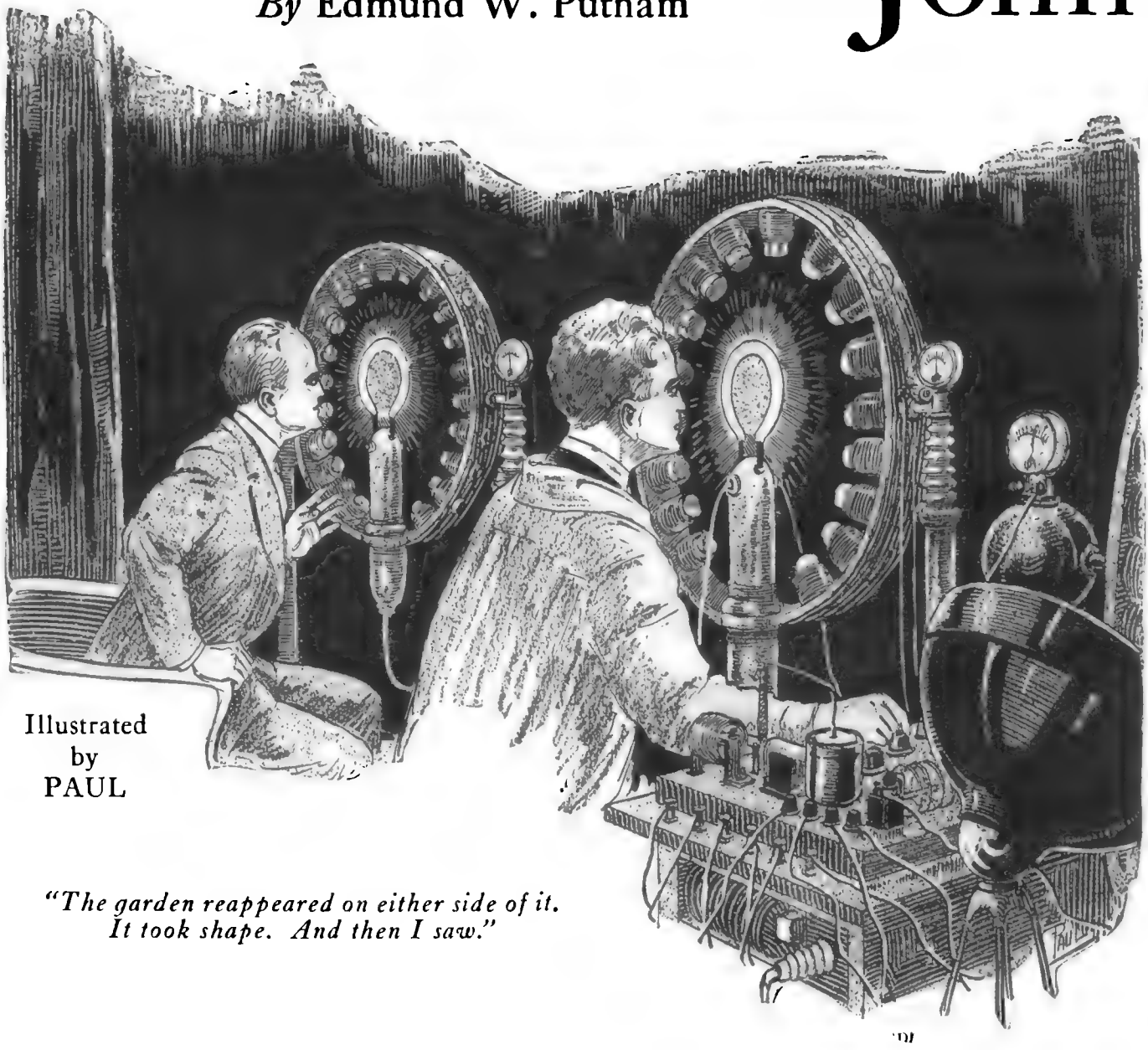
READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a text-book. Moreover, most of the stories are written in a popular vein, making it possible for anyone to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge of science.

1. How are columns reaching from roof to floor formed in caves? (See page 489.)
2. What are "shooting stars"? (See page 506.)
3. What is the distance of the nearest star? (See page 509.)
4. What is a probable cause of *nova*, new stars which suddenly burst forth? (See page 509.)
5. Calculate the ratio of volume of the earth to a star 535,000 miles in diameter. (See page 513.)
6. Accepting as light the ether vibrations above and below those by which we see, where would we look for invisible light? (See page 522.)
7. Can you give a popular description of the quantum theory of matter? (See page 523.)
8. Can you explain the action of the gyroscope as apparently affected by the rotation of the earth? (See page 531.)
9. How could gyroscopes produce power? (See page 532.)
10. What is the origin of Cosmic Rays? (See page 558.)
11. How can very high electrical potential be stated? (See page 563.)
12. What two great divisions can be assigned to music? (See page 566.)
13. What is the ultimate reaction between chlorine and water? (See page 566.)
14. Is the presence of air or some equivalent essential to the action of a rocket? Does air help it? (See page 570.)
15. How high above the surface of the earth did the shells of the long range guns rise, that bombarded Paris from a distance of 75 miles? (See page 571.)
16. What would be the apparent length of the day for a traveler going east and going west on a fast ship? (See page 571.)

The Translation John

By Edmund W. Putnam

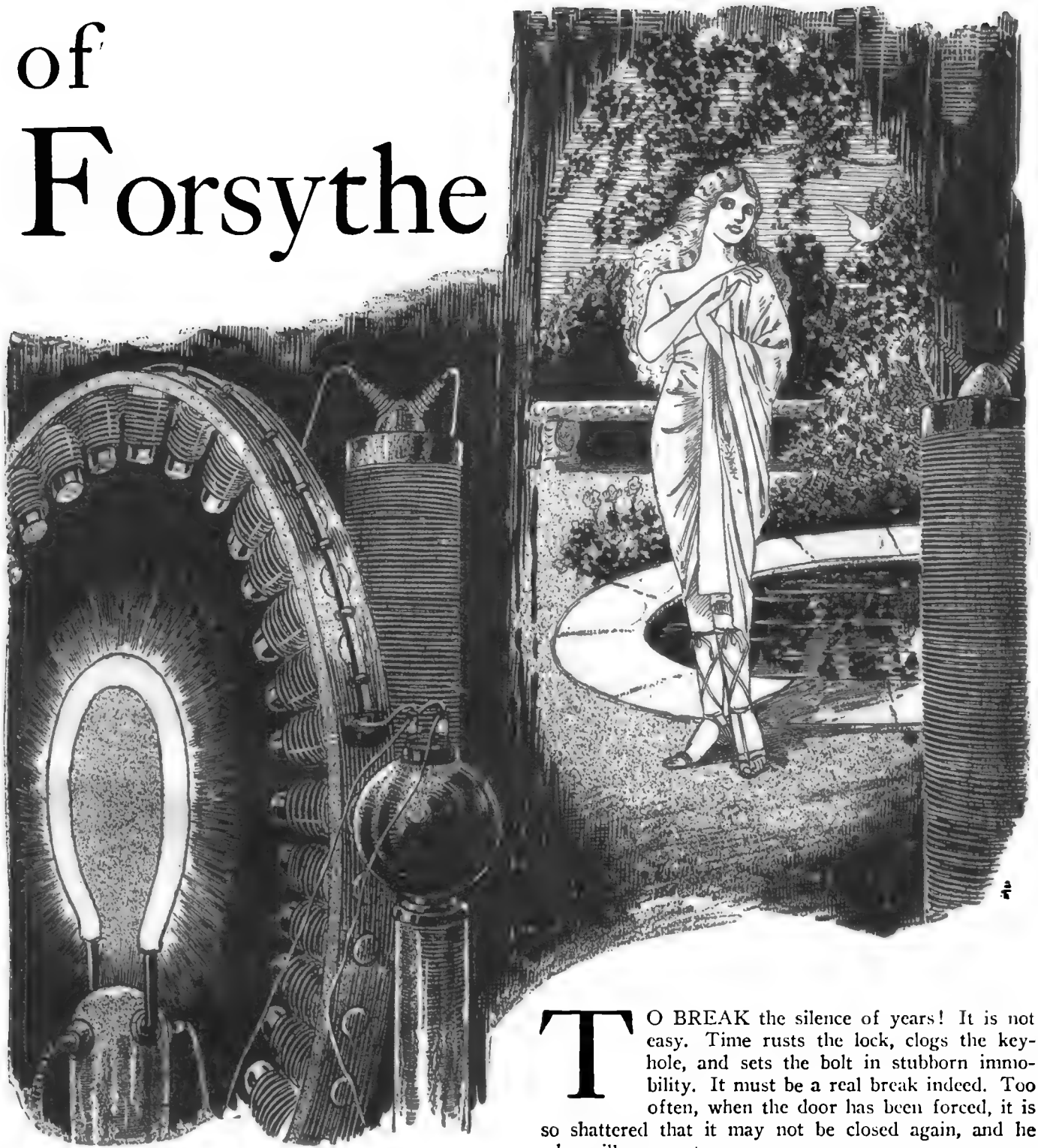


Illustrated by PAUL

"The garden reappeared on either side of it. It took shape. And then I saw."

TWO things cannot occupy the same space at the same time. That seems logical and beyond question of doubt. On the other hand, it seems just as sound to state that if a thing is in a given spot it can be seen. Yet we know that is not always true, for the human eye, as well as the human ear, is tuned to certain rates of vibration. We cannot see an object by light that exceeds or is below a definite rate of vibration, nor can we hear a sound either above or below definite rates of vibration. Yet the noise is there. So is the object. There is undoubtedly plenty of room for experimentation in this field—which in turn makes it natural that this excellently written story should be so absorbing.

# of Forsythe



THE death, a few days ago, of Richard Isham, has brought back to the pages of the daily press many stories of that catastrophe which but a few short years back, passed him by, but snatched from us John Forsythe, the Benefactor.

I feel, therefore, that the following revelation, found among the effects of Mr. Isham, will prove of vital interest to the world.

It has been pointed out by a scientist that there are several doubtful details in the narrative—the suggestion of colors, for instance; but, on the whole there is an air of truth that is convincing, and I present it as found without further editorial comment, except to call attention to the probability that the first and the last "explosion" (this from our scientific member) were the results of removing almost instantaneously from our atmosphere large bodies, and leaving vacua in the stead. The gaps found in the text denote some missing pages in John Forsythe's manuscript.

TO BREAK the silence of years! It is not easy. Time rusts the lock, clogs the keyhole, and sets the bolt in stubborn immobility. It must be a real break indeed. Too often, when the door has been forced, it is so shattered that it may not be closed again, and he who will may enter.

That is my reason for waiting until I shall be beyond the reach of intrusion before opening this door to let in the world, ever ready to disbelieve and to peer—as it has ever done at all the impossibilities that are now the commonplace of life. Yet, sitting, as I do now, with definite vision behind me only, and with eyes peering forward into the mists of the unknown, I sense a wisdom that ordains just such a scepticism. Full knowledge is too bright a light to be flashed suddenly into the blackness of our ignorance—it blinds! The wilfully closed eyes of mankind are merely the instinctive protection from the unbearable brilliance of knowledge.

And so, as I now believe, I am the destined of that

Wisdom, safely dull in my ignorance, to reflect this light wanly and feebly, and yet enough that it may not be entirely lost.

The biographers of John Forsythe have given in fullest detail his life and the incidents thereof, all but the most important. And for this omission they are blameless—he and I alone knew of it. I believe that the record of this master mind—one that drove straight for its goal, and allowed no *success* to turn it—should be complete. I, alone, can supply it.

The misstatements of his biographers are inconsequent. I take this opportunity, however, to silence from the grave the insinuations of the vicious-minded. He was not my son. That his mother was the one woman to me, is true; that her son was as dear to me as if he had been my own, is as true as it is natural; that she chose John's father as the better man is also true, and final!

Some ghoulish realists will be disturbed to know that the charred remains of his body do not lie beneath the great shaft erected to his memory—as if it were needed—by The Associated Medical Societies; yet even the truth cannot detract from the properness of that tribute. Humanity as a whole will concede that.

And now, with an apology for this preamble of an old man, I begin:

THE dreams began in his babyhood, although the details of them are, of course, the recollections of later years.

As a tiny fellow he talked freely about them: his "bootiful lady." "She's awful nice, Mummy. She lives in a garden, with funny flowers, all kinds of sparkly. An' she's so pretty, an' her hair's awful long, an' all wiggly, like water when the sun's shining. It's diffrunt than yours, Mummy; though yours is pretty, too," he would add, loyally.

We laughed a little at him, at first. "He's going to be a great poet and a dreamer," his mother would prophesy.

But, as the dreams became more clear to him, his vivid enthusiasm in relating them awoke within her a growing anxiety—and a jealousy. This I can readily understand.

I saw him at the peak of his enthusiasm but once or twice (even at that early age he was reticent, except to his mother) and yet that eager child face—that strange, vibrant light quivering behind the baby eyes as he described his garden, is still before me. Always the same garden, and always the same place: "a great big pool of water, Mummy, with white stone all around it, an' a great big bench, an' she sits on that, an' holds out her arms to me the way you do. Only I can't touch her, 'cause it's just as if there was a piece of glass there."

"He talks as if he had really seen what he tells about," Alice exclaimed to me one day, in her worry. "Oh! Dick, you don't think there can be anything the matter with him, do you? I'm going to have Doctor Simpson look at him."

But the doctor found only a very healthy little body, and a very quick, sensitive little mind. "Normal, absolutely normal, Mrs. Forsythe. Perhaps a bit high-strung. That's all. Turn him out more with other children; keep him away from fairy stories, and there'll be nothing to worry about."

It speaks much for the sanctity of the medical "confessional" to note, that during all these years, the one outsider who knew of the dreams has never spoken of them.

It was her discovery that the dreams came only in the daytime, when he took his afternoon nap, and never during the night, that led to their discontinuance. I remember well his loud bewailing, for a few days, the loss of his dream friend, and the passing of the tragedy into the quick forgetfulness of childhood. I remember, too, my amusement at his mother's shamed pride in having "defeated" the beautiful lady with the wonderful hair, "though yours is pretty, too, Mummy."

Occasionally, he would recall and speak of the dreams, but as the trusting, confiding early years slipped by, he became more and more uncommunicative, spinning about him that cocoon of reticence with which the human soul protects its tender plasticity during the long metamorphosis from child to man.

* * *

——Talking in a muffled way. I hurried in. There, groping toward the far end of the room, he stood; "I can't get through—I can't get through," he was muttering. He turned toward me as he spoke. His eyes were wide open, not staring dully, with the sightlessness of a sleepwalker, but scintillant with a strange light—seeing, searching eagerly—and looking right through me.

"John," I cried sharply. I grasped his shoulder to shake him awake, and a tingle shot up my arm, severe enough to throw my hand from him. The boy's eyes closed slowly—slowly—and opened with a quick start of consciousness:

"H— Hello. Uncle Dick. Wha— what's the matter?"

I was shaking my hand to rid my fingers of that prickling tingle—like the shock of a blow on the "funny-bone."

"You've been sleepwalking, and talking," I retorted. "And I must have twisted my arm when I shook you awake. Yes, you were. You were muttering away at a great pace. What can't you get through?"

His face flamed with the painful embarrassment of youth. For a moment, he stood, motionless: then he turned, walked to the window, and looked out. I mention this in detail, because to me that minute or two of silence marks the beginning of the Quest, whose *failures* have wrought such changes in our lives today.

"Uncle Dick," he said, turning suddenly to me, "I am going to ask you not to say anything about this to anyone—particularly not to Mother."

I remember well my impression that this was not so much a request as a command, a command to which I found myself respectfully ready to submit. This was no longer a boy who spoke.

"I was talking, you say?" he questioned. "Talking aloud?" A puzzled frown deepened on his forehead. "And your arm tingled when you touched me? Hmm——"

That was all at the time. During the following years, he never mentioned the incident directly, but from time to time he spoke so, that I could easily see that it was ever-present in his mind.

The night before he left for college he talked freely for the first time. It had been very evident that he wanted to be alone with me, and after an awkward attempt or two upon his part, I carried him off to his father's library, a beautiful, and in these days of con-

densed living, rare example of what such a room should be.

He began at the very beginning—the childhood dreams, and followed through to the moment. The painstaking care of the early experiments—gropings perhaps would be a better word—presages more than anything else the reason for his ultimate success. I think it worth while to give them in as much detail as I can recall.

* * *

(It is more than unfortunate, particularly as Mr. Isham seemed to place importance upon this portion of his narrative, that the most careful search has failed to reveal many succeeding pages. It might be assumed that they were not satisfactory to him and that he had destroyed them, intending to re-write their contents. The remaining portion of the record begins a short time before the supposedly fatal "explosion.")

It is really that night which stands out most clearly in my recollection. About the rest, there is a certain haze of unreality—of almost disbelief; but the picture of him reclining in his father's great chair, placidly puffing at his cigar—still a young man, of the type I like to think of as the American—holds sharply.

It was difficult for me to realize that here sat the famous John Forsythe. And yet, as we had walked from my train to his car, in the afternoon, I had been conscious of the attention he had attracted. More than all the reading of his fame, this had brought it home to me. His annoyance at the personal publicity had been characteristic.

It was difficult, too—a real effort—to catch up with the passage of the years during my absence; those years that had taken Alice and John, Sr., whose money had enabled this lad before me to revolutionize medical science.

The touch of gray at the temples was new to me, but this only set off the youth of his eyes—those eyes in which there was perhaps a difference—a softening of longing. As I re-read this, it seems possibly the sentimentalism of remembrance—and yet there was a difference.

But there was nothing to suggest the greatest of all dreamers—that one who makes his dreams come true—his visions realities—not only for himself, but for others. The determination and will-force were not even obvious; in fact these were ever somewhat of a surprise to those who encountered them—his college faculty, for instance.

You will remember, that after slaving for more than three years, both over his physics textbooks, and in the laboratory, to the great detriment of his other studies, by the way, he suddenly quit absolutely. Furness makes quite a point of it in his "Life," but is, of course, utterly unable to give the reason, or even to suggest any but the common explanation, when a scientist, even one in embryo, turns from applied science to an intensive study of the supernatural.

When the inevitable faculty reproof came, they were a bit astounded at his reply. With no effrontery or egoism, he stated his opinion, and incidentally flicked the physics department on the raw: "You cannot teach me what I want to know. I cannot see the use of wasting time experimenting on forms of matter, without knowing more nearly what matter is. I am endeavoring to find out in my own way, and as that does not meet with your approval, I can only leave." And quietly and decidedly he did.

They hated to let him go, for even then his Vibration screens were attracting attention throughtout the scientific world. They endeavored to bring parental pressure to bear.

The ensuing scene may indicate where the boy got his firmness. John, Sr., read the faculty plea, and tossed the letter to his son:

"Working on a scheme of your own, John?"

"Yes."

"Want to talk about it?"

"No, Dad."

"They can't help you?"

"No, Dad."

"All right; go ahead with it, and keep your mouth shut. I'll back you."

As this last comes back to me, I cannot but regret the counsel. John did keep his mouth shut, even to me, and his letters are, therefore, of no value whatsoever; and apparently I am the only one to whom he wrote at all. Had he been more communicative, there might have been some written help to those who must and will seek his last and greatest discovery.

As I say, it was difficult for me to believe that there sat the master scientist. And yet the very light by which I saw him sitting there, came from his marvelous Luminium, the perfection of which has not only spared unbelieveable expense in the days of artificial illumination, but has saved for us, from the insatiable demands of power, the beauty of our waterways; and but a short time previous, the perfect photograph made possible by his reflecting-focus X-ray method had saved me from an unnecessary operation. Under the old shadow picture regime, they would have had me on the table *instanter*.

There! That is how the personal injures the report by an individual. To speak of the work of John Forsythe, and to mention anything before the Sigma Ray, is utterly absurd. And yet, merely because I am not suffering, nor have been, from either of the two great scourges which his genius has pushed to the point of extermination, I cite the lesser wonders first.

But to get back to that night of explanation.

We had been smoking in silence. I was waiting for John to begin what he evidently had to say, and he was obviously searching for a starting place.

"Uncle Dick," he said suddenly, "you remember what I told you the night before I left for college? About the beginning—the day you found me in that 'dream'?" He spoke the word in quotation marks. "That the 'dreams' came only in the daytime—never at night—only in my room—how I had tested that thoroughly—that I remembered everything perfectly, which no one does in dreams—about your arm tingling—and all the rest—? I telegraphed for you to come, because I have found the answer to it all.

"I have never dreamed that garden—I have seen it, that's the matter in a nutshell. It is as real as you and I—as this room—these books. Under some conditions I have been able to see it, under others not. It can be made visible to anyone—that I know!"

He seemed unnecessarily assertive, hestitated a moment, and then, with a quick, belligerent glance at me—daring me, so it seemed, to doubt or to contradict—added: "She has told me so!"

"She—?" I asked.

"My—my Beautiful Lady. I—I still call her that. I won't try——"

"But how——?" I interrupted.

"I—don't—know! She looks at me with her great eyes—and—thoughts come to me. That is all that I can tell."

"Look here, John," I cried in amazement, "you are not trying to tell me, that you—John Forsythe—here in the middle of the twentieth century, are offering thought-transference with a—a dream-girl as a——"

"No, Uncle Dick," he said quietly, "I am not. For you see she's not a dream-girl—she's as real as we are. The thought transference, yes. How, I cannot explain. And yet every move I have made in the last twenty years has been under her guidance."

You millions from whom John Forsythe has lifted the threat of a lingering, hellish death, may perhaps understand my thought: "God moves in a mysterious way——" The quest of a childhood dream leading to the conquest of the demons of pain and of death!

"Uncle Dick," he continued, "what do you know about ether, light, electricity, atoms, electrons?"

He tabulated the words with puffs of cigar smoke. I suppose I may be coloring my narrative to say that I seem to remember his watching the tiny clouds of rolling vapor with eyes that saw more than mine.

"Nothing," I replied, "except that I hate the smell of the first, and that it always makes me beastly ill afterwards."

His smile was a very gentle reproof to my levity.

"Good. Now listen!"

For a long time he talked; far into the night. I can see him there yet, as he sat, a normal looking young man in normal surroundings, uttering the most unbelievable statements with amazing conviction and convincingness. He tried to keep down to words of one syllable, so to speak, but again and again his enthusiasm made him forget the ignorance of his listener, his eyes would gaze afar at some vision of unreality made real, and his explanations would soar far above me. A sorry trick of Fate—pearls before swine, indeed! Could an Edison or a Faraday have been his auditor!

In my feeble way I shall try to put down the substance of what he said. There may be in what I can remember some clue to the initiate.

There is no such thing as matter. Nothing but this ether, a "substance" almost infinitely dense (proved, he said, by the speed of light and electricity, though I didn't quite grasp why), and that what we called matter was nothing but electrified flaws, or holes in this ether. When I asked how that could be, and how we could move through this solid substance, he said it might be compared to a glass of charged water. There the bubbles of gas were not nearly so dense as the water, and yet they could move about freely.

Nothing but the ether, then—and the motion of these little particles that were electrified; on this he laid great stress—the *motion* of these. As far as I could gather, these tiny particles whirled about each other at terrific speeds, and that there were two kinds of them. Sometimes, there would be just a few of them whirling together, and sometimes a lot, and according to the number doing this wild dervish dance, they made gold or iron or lead or anything else: that is, each little bunch made an "atom" of that "substance."

Then he went on about the vibration of these tiny particles inside the atoms. To reach our consciousness, "matter" must be vibrating between certain speeds (he said something about the "theory of the absolute zero" being wrong) and at the various speeds was evident to us in different ways. It was "normal," or glowed with "heat," or gave out "light" or "electricity," etc., according to the rapidity of vibration of these "electrons," flying about inside the atom.

That was not hard to grasp, but when he continued about "invisible light," I began to lose him; though I could get flashes of what he meant, when he explained, in quick parenthesis "like X-rays, or sounds too high for us to hear."

From then on my brain was in a whirl: Matter of such high vibration that not only could we not see it (I think his phrase was "totally non-reflective or refractive to the rays of the visible spectrum) but so much on a different "vibration plane" that we couldn't even *feel* it, was too much for me.

"Do you mean to tell me," I cried, "that if a chunk of rock had the shakes hard enough, it would disappear? That it could be right here on this table, and I couldn't see it, and what's more couldn't feel it?"

"That is exactly what I mean, and just what is so," he replied calmly.

"But that is breaking the first law of physics," I objected. "Two things cannot occupy the same place at the same time. I remember that much from school."

"The first law of physics is wrong!" was the cool answer, and at that amazing assertion I gave up.

"As to that," he added with a smile, "it is my firm belief that your rock is there now, and that, in fact, we are sitting at least thirty feet below the surface of what you would call solid earth."

"All right," I said feebly. "Go as far as you like, but I won't promise to believe you."

"You'll believe," he asserted confidently. "Now for just one word more of general explanation, and I'll let you stagger off to bed. I know that this is a bit boring to you, but I want you to have some idea of how you are going to see.

"You know that the human body is thoroughly charged with what we call electricity—you've played with the sparks of it on cold days. Many believe, and I am one of them, that thought is 'electrical.' Some people have visions. Did you ever hear of a normal person having one?—No. And why? *Because their brain vibrations were not rapid enough!* But take a man, or a woman, for they are more sensitive to excitation, in an overwrought condition—worry, fear, fright, religious exaltation—and what happens? The brain vibration speed is rapid enough to do in a small way what I am going to do in a better way, and that person has a 'vision,' 'waking dreams,' or dying views of a 'better world.'

"It seems that I am in a sense abnormal. My brain is, under certain conditions, receptive of a speeding up, and I have seen. I firmly believe that the speeding up is the result of deliberate outside influence, and that I know the source of it—"

"Your dream——"

"Yes. How, I do not know, but it is through her that I have seen what you will see tomorrow. Because of her, I turned to the study of matter, and quickly stumbled upon the suggestion of its indefiniteness. Under her guidance, I progressed. Under her direction, I turned to the so-called supernatural, and found much there that fitted into the puzzle.

"Twice before, I thought I had succeeded; now I

know I have, my preliminary tests have proven that. We are such stuff as dreams are made of, and we walk intermingled with other dreams, yet all are real. Queer, isn't it?"

"You mean that this garden of yours is just part of another world, that is all mixed up with us, and we don't know it?"

"Just that! And a world as 'solid' as ours!"

"With living people in it?"

"With one that I know," he answered softly, and his tone was not that of the scientist.

"But, John, she—she is more than thirty years older than when you first saw her."

"The glory of her is unchanged," he said.

At breakfast the next morning, I noticed John's anxious glances at the day outside. Twice he walked to the window to look at the sky.

"What now?" I asked.

"Clouds—I need the sun."

"Why not your Luminium light, and to the devil with the clouds?"

"No," he answered with a wry smile. "Even the great scientist John Forsythe hasn't yet been able to equal Nature. It's the highest of the invisible rays we need. Come on, let's go up to the laboratory."

"Where is it?" I asked, hastily gulping down a second cup of coffee, that must have been vibrating fast enough from the way it burned.

"My old room, of course. Can't you understand that that is the only place from which the garden can be seen, because that is the only place it is. We'd get a worm's eye view of it from here."

It was a strange place—that laboratory on the top floor. One partition had been knocked out, leaving a room about thirty feet long. Black it was, all black—floor, ceiling, walls—painted to a dead surface that seemed to absorb every ray of light that streamed through the open door behind us, and to reflect not the tiniest gleam. As John closed the door, the blackness became absolute. Then, there was a sliding noise, and a sudden illumination. Looking up, I saw a panel in the ceiling had opened, disclosing a number of Luminium bulbs. The light from these, despite its brilliance, seemed also to sink into and through the black walls. It penetrated and pierced the heavy gloom, without in the least dispersing it. At each end of the room I could just make out a mass of deeper blackness—and that was all.

From one of these masses, John threw back a covering, and I saw that it was some kind of an electrical machine. On the side facing the room was a great vertical circle of magnets, and opposed to each other, and about two feet beyond the circle, were two huge coils of wire. In the center of the circle, was a curiously twisted and bent rod of some whitish substance, like quartz. It gleamed in the light with a sort of unreality, more like the ghost of a thing than a thing itself.

"That," said John, pointing to it, "is the very soul of this machine, the important one. The other only helps establish the magnetic field. This is how it works. . . ."

I could not begin to understand his explanation. There was something about an "ether-lens" created by the magnets, and "light-sorting" by prisms inside the machine. The sunlight, reflected by a mirror on the roof, passed through the machine, where the visible light was "screened out" of it, and the remainder, the invisible light was shot through the crystal bar. This latter did something—polarized, and some other word he used, and the thoroughly upset remainder was "speeded-up" and focussed through the ether-lens on the magnetic field before the machine.

I doubt that this feeble description will be of any assistance to those who will follow in his footsteps, but I give it in the hope that it may be a slight clue to a trained physicist.

I venture to remark, however, that even a trained physicist might have found difficulty in following John's hasty exposition. He was evidently too much interested in putting the machine to work to care much about my understanding the mechanism.

Oh! yes. There were to the left of the machine two smaller circles of magnets around lenses of the same crystalline substance. These, he said, were for us to look through, and translated (that was the word he used) the high vibrations into lower ones that would affect our eyes, and we could see whatever was "illuminated" in the field.

It was late in the morning when we took our seats before the translating lenses—I with a strange and uncomfortable feeling of nervousness. With the closing of the ceiling-panel, the blackness rushed down upon us. It was like the plague of Egypt, darkness that might be felt. I found myself trying to pierce it with straining eyes, and it was not until, at John's suggestion, I closed them, that the oppression, almost like a suffocation, passed. Even then, I had a feeling of numbness, of helplessness, and I realized as never before how much we are indeed children of light. How much of this sensation John had, I don't know. It may have been merely his eager tenseness that put the tremor in his voice, as he answered my strained question:

"Only a few moments more, Uncle Dick. We must let our eyes become very sensitive to any radiation. Keep yours closed until I give the word."

It seemed an eternity until I heard a lever move, and a scraping sound as John threw over a switch.

"We're off," he said, and I opened my eyes—upon nothing but the horrible blackness.

Then, the faintest impression of a hum reached me. It wasn't a real sound, for it didn't come through my ears, but a pale ghost of sound that crept dimly into my brain itself.

"That's the light, protesting at the way it's being torn to pieces," whispered John. "Sort of an imaginary sound. Only a moment more now. It takes time for the ether-lens to form. There! Look!"

From the machine at our left crept forth into the room, not a light, but the sensation of a light. I could no more *see* it than I could *hear* the hum. Yet there it was, a something like a wavy phosphorescence, unreal and weird, so faint that it seemed to fade into nothingness, only to reappear. And it made no impression on the surrounding blackness. That was as dense as before.

Brighter—that is the only word I can use, and yet it is a wrong one—and brighter it grew, soaking into my eyes. And there was no light! I turned to where John sat beside me—blackness; I peered over the top of my lens—blackness; and through the lens the glow waxed to a reality.

And then, suddenly—I saw!

In the ghostly radiance, objects began to form, dim and indistinct at first—but I saw them with my eyes!

More and more clear they became, materializing before me, until they showed, not as uncertain wraiths of things, but solid, actual.

There, as if I were peering through a great round hole in a black wall, lay part of a beautiful garden. Directly in front of me, where the magic light of the machine was strongest, it was clear and bright, as if bathed in brilliant sunlight, but toward the edges of the "hole" it faded like a vignetted photograph.

To the left, was the edge of a crystal pool, bordered with what looked like white marble. A stretch of soft turf swept down from the right to a huge flower bed, through which ran a path to a massive, carved stone bench. In the background were trees and shrubbery that blended into the invisibility beyond. For a moment, it looked for all the world like part of some wonderful, normal garden on some great estate, and then the lack of something struck me. Color! There was none! I could see differences of shading, and I could feel my eyes trying to grasp impressions they could not quite hold, sensations of beauty that barely eluded them; but, except for the tinge of palest violet at the edge of the "hole," there was no color as we know it. Not that there was a sense of deadness. Far from it! The whole garden quivered with life, and flashes of heavenly tints seemed just about to appear, only to melt back again into shimmering, indescribable loveliness.

"That is my garden, Uncle Dick," it was John's voice from the blackness beside me, "as I have seen it for years."

"It is the most beautiful spot in the world," was all I could answer, and I believe that neither of us noticed the incongruity of my words, nor, at the time, did we give a thought to the fact that here we were watching the foundation stones of Science crumbling before our eyes. We merely gazed, and gazed!

I found myself staring particularly at the trees and the flowers. Their leaves and branches were in ceaseless motion, and suddenly I realized that this was not because of any breeze, for they moved in all directions. It was conscious motion—free motion! They were alive—alive as our animals are!

"And why not," John replied quietly, in answer to my exclamation, "and why not? Even some of our own plants have free motion. Perhaps the high vibrations in which these live make them more advanced in the scheme of things."

"But this is so different," I cried. "Look at that tree bend down to the water, and look!—look at the flowers now!" They were all turning toward us, and they were waving and beckoning, like a bunch of excited youngsters, at something behind us. I turned instinctively to see at what—and there was the solid blackness of the laboratory. So real had been the impression of actually sitting in the garden that my brain was dizzy.

"You are missing the true wonder, Uncle Dick. Look at that path, at the border of the pool, and most of all, at the bench. It would take some very strange differences of vibration to make stone turn itself into a bench, and carve itself. And I have been wondering how long it would take you to notice the best of all. Look again at the path."

There, close before us, in a soft spot in the surface—clear and distinct—a footprint! I know now how Robinson Crusoe felt; but this was no Man Friday record of a savage inhabitant—this small imprint; nothing but the dainty sandal of a woman or a child could have made it! Farther down the path was another, and then another, and they led my eyes to the bench. Not till then did I see the scarf of some shimmering material, that lay, blending with the iridescence of the grass, beside the carven seat.

"She'll be coming back for it," whispered John. "She'll be coming back!"

And then the clouds! A quick fading of the brilliance of the scene before us—a pouring of shadow that thickened to darkness, and—the awful blackness of the laboratory again.

Throughout the afternoon, we sat there, watching and watching. The hours were painfully long, as all waiting hours are, and the silence of the room was broken only by the clock-tick of the machinery that kept the mirror on the roof turned always to the sun. At moments, the cloud veil between us and the sun would thin, and a faint suggestion of the garden reappear; and then the blackness would creep slowly across it again.

It was late in the afternoon, when the clouds finally broke. The machine at our side began to vibrate again with that strange inaudible hum, and the glow in the field swept rapidly to reality and vision. Our eyes leaped to the bench—the scarf was gone!

"We have missed her," said John calmly. "She won't be back today. There is no use in waiting further."

I was indignant at his willingness to accept so calmly the disappointment, and to leave the wonder before us. I certainly did not accept it, and delayed a little. And then I realized that all of this was an old story to him; no longer a revelation, as it was to me.

I was reluctantly leaving my translation lens, when the flowers again caught my attention. They had been standing motionless, as if drowsing in the afternoon, their graceful bell-shaped flowers, like a lily, but more delicate, drooping like the bent heads of sleepers, when they suddenly awoke to eager movement. With a little shake, each straightened, the petals opened wide, and the whole flower swayed into a rippling, waving, beckoning dance. There was something sensuous, something emotional about it all. I found a certain embarrassment in the watching. Then, the something that had aroused them swept into the Field: a great swarm of enormous butterflies, like—well I have used the word before, but there is no other—like the ghosts of rainbows; and to them the flowers were offering each its beauty, as best it could, and each with unrestrained desire.

"No, I cannot see that it is so amazing," replied John to my cry of astonishment. "Ours do the same, only they are restricted to color and scent."

That may be true, but I was gripped with wonder in watching a great blossom sway enticingly toward a hovering butterfly, stretching wide its petals, and quivering with unmistakable delight when the insect came to its embrace.

At last, it became evident that despite my reluctance to leave, there would be no further use in staying. Fainter, and fainter became the whole scene, and we could see in the garden the lengthening shadows, which bespoke the sinking of the sun.

"The same sun as ours, you see," said John. "That is why we can see the garden only in our daytime, both because the machine needs the light of our sun, and because they also need the light of our sun to be seen.

They can't have our moon, though, for that lady can't reflect their kind of light, and must be invisible to them. They might have a moon, at that, which they can see and we can't.

"You see, also, that the two worlds must be in almost the same position—the similar time of sunset proves that. And right here the ground level shows a difference of only about thirty feet."

"Are you just a cold-blooded fish," I cried. "Here you lecture along as if you had not demonstrated the greatest step forward ever made in scientific knowledge. Haven't you any emotions—can't you get a thrill out of anything?"

"Not out of this little thing, Uncle Dick. There is only one thing for me in the world, or *out* of it, I should say. Tomorrow we may be in better luck, and then perhaps you can understand."

But tomorrow, and the next day and the next, found fate against us. The warm spring rains that were bringing delight to the suburban gardeners, fell from gray clouds that blocked our only source of proper light. I was the impatient one. John smiled at my irritation.

"After waiting so many years, why fret over a day or two more?"

And yet there had crept into his face a drawn look—a suggestion of hopelessness—as of a runner who had thought his goal within reach, only to find his strength failing and that he had sadly misjudged his distance.

THE fourth morning ushered in a day that was to bring me the explanation of what till then had been beyond my comprehension. How could this man be so insensible to his great achievements and so utterly indifferent to his successes? This day I was to know.

The hours of waiting for the sun to reach a proper height above the surrounding buildings were endless, and the half hour of necessary submersion in the blackness of the laboratory was longer than all the early ones together, and I felt a rising resentment to John's apparently placid patience. Indeed, I was surprised at my irritation when he voiced his conviction that today I should see the full proof of his theory. What further proof could I want? I believed as firmly in his Lady as was possible—the footprint, and the scarf had been convincing enough; and yet he spoke as if the whole matter lay still in the beyond.

Then, at last, the sound of the lever, the rasp of the switch, the moments of tenseness—and the garden glowing in the sunlight and reality. Everything was as before, except that the foot-prints were missing. "They have had rain, too, then," remarked John. There was no sign that the moment had come; yet, just as he spoke, I felt his hand on my arm, gripping it fiercely. He knew!

The touch drew my eyes from the lens to the blackness beside me, and as they returned to the garden, the whole field was obscured by what seemed a filmy, shimmering mass in sweeping motion. Away from us it moved. The garden reappeared on either side of it. It took shape. And then, I saw!

Floating draperies, and the waving glory of her hair. Directly down the path she had danced, and *through us* who sat in her way. The grace of her should have prepared me, for never did a woman of this earth move with such melody of motion, to which the ripple of her garments wove accompaniment. I am no poet, but thoughts came to me, and words. On she danced to the bench, and as she passed through the rows of flowers, they swayed toward her lovingly, and she bent above them, as if speaking.

I could feel John's hand close painfully upon my arm: he was breathing in short gasps that quickened with a choking stress—and then she turned. Straight toward us she looked, and I do not exaggerate when I say that I experienced a true physical shock. I have read of the beauty that blinds, but the glory of that girlish loveliness struck like a blow. She took a hesitating step toward us, her eyes full upon mine as she came, and the heaven of that gaze sank down and down to my very soul. I could feel it, cleansing, purifying me to the core, and a joyous betterness warmed me—and a thankfulness. Only for a fraction of time was I vouchsafed that wonder, then the puzzled eyes turned from mine, and I saw a great light leap within them. Indeed it was well for me that I did not have to meet directly that full radiance. But I know that it never could have been for me.

John's touch upon my shoulder slackened, his hand slipped downward; and I swear I could almost feel the life go out from him, pouring forth to meet the heaven that called him. Even I could feel the call, the conscious willing of her. Slowly, two perfect arms raised themselves in mute appeal, the slim, rounded body lambent through the flowing draperies swayed toward us, as the flowers had swayed, and the great eyes spoke—summoned!

For only a tiny fragment of eternity I sat in the faint edge of that radiance, and yet that moment is eternity itself to me. Then and there were wiped out all doubts. Then and there, I knew the certainty of rightness—I, too, for the first time "saw that it was good," and believed, and was thankful.

A half groan, half sob from beside me in the blackness—a sudden movement, and the panel in the ceiling rasped back, the glare of its lights blotting out the garden.

There, by the switch, stood John, with a mortal anguish distorting his face. For a moment he stood, and then, with a gesture of infinite despair, he stumbled from the laboratory.

Not until midnight did I see him again. I spent the evening pacing the library, waiting for him, I felt that he would come. And during my hours of waiting, I began to realize. It was then that I knew why his successes had been to him such mocking failures; and as I longed to glimpse that radiance again, I found myself in full agreement with his valuations.

When, at last, he came, I was shocked. He had grown old within those few hours, and lines that great suffering only can carve lay deep upon his face. He answered my unspoken question:

"The tortures of the damned, Uncle Dick. Why couldn't I have been content to spend the old man's money like dozens of other rich men's sons? What devil put this idea into my head? And forced me to follow it up to this? Can't you understand? A miser with all the wealth in the world just out of his reach, and he helpless to get it—a starving man with food in sight, but not for him——! As long as I saw her only in my sleep—as long as there was the slightest chance of her being only a vision—an unreality—an ideal, created in my own brain—God! that was bad enough, but bearable. But now! Really to see her—to know definitely that

she *is*—and to know that she is as unattainable as the Heaven!"

He dropped into a chair, and broke into that most horrible of sounds, the great, deep sobs of a grown man in uncontrollable grief. The touch of my hand on his shoulder—there was nothing I could say, and I am thankful that I did not try to speak—quieted him. At last, he raised his head, his grief once more under control.

"I'm sorry, Uncle Dick—but something had to go, emotions or my reason. I've been nearly crazed. Can't you understand? You asked me whether I was cold-blooded—are you? Don't you realize what we have done?"

"She didn't look at *me*, Boy—and yet I feel I know."

"What can I do? I've got to go on—somehow! And I—don't—know—how! I could be patient before—I've been patient through years of defeat, because I had something to work for and something definite to work on—but now! The only thing I know is that I must get to her—— And I—don't—know—how! Even how to begin! If I knew or even thought that death could do it, I wouldn't hesitate a moment. But it might only lose me everything, even the sight of her. That's the only reason I'm here now—— At that I may have to risk it."

It was just as I started to expostulate with him, "Risk nothing," I had shouted, when the idea came. No! It wasn't an idea, I wasn't thinking; words suddenly formed themselves in my brain: "Why not the Ray?" and I found myself repeating them aloud.

The explosion of hope in John's eyes was startling. He stared wildly for an instant, and leaped to his feet in his excitement:

"You may have hit it, Uncle Dick—you may have hit it! There's no impossibliity about it." He was pacing up and down the room now—his face aglow. Suddenly, he turned:

"Where did you get that idea?"

And I told him, while he stared.

"Why to him?" he muttered. "Why to him, and not to me?"

Then he smiled, the lines of pain faded from him, and he stood with up-turned eyes, as if listening: "Yes," he said, "yes."

"It's all right, Uncle Dick. It's all right. We may have to do a lot of experimenting, but now, once again I've something to work for, and I know how to begin. Don't know what the effect will be on animal tissues. Always have kept out of the way of it—the Sigma Ray nearly got me, you know. That breaks down animal tissues—this may nearly explode them. No it won't. She couldn't get to me, because I was being such a fool, so she tried you," he threw in parenthetically; and then I knew where my "idea" had come from. Don't tell me I'm queer, you gentle readers. I know what happened, and I'm too near the Unknown to lie—or even to imagine. "Didn't do it to flies—but it killed them. Try higher development—Guinea pigs!"

Guinea pigs it was, those unsung martyrs to science, lone ones, pairs, crates of them. And always the same result. There, on the table, which we had placed to bring the subject full into the focus of the Ray, would be the poor animal, happily munching a lettuce leaf. Out would go the lights—the wait in the dark—the eerie glow, which, mind you, did not show the animal at all—the light again—and a quite dead guinea pig, and never a sign of what had killed it. Autopsies—hundreds of them—each as useless as the first.

Rabbits—futilely!

We tried the Ray at all degrees of strength, and added only to our list of victims. The disposal of the bodies became a problem. The servants began to look at me askance. There had never been such slaughter of the innocents before my coming. There was one annoying, but rather amusing, interview with a representative of a humane society, who came—think of it, you thousands saved from suffering by him—to accuse John Forsythe of cruelty!

It was while out in the car, going for more victims, for, despite our constant failures, John was as persistent and as hopeful as a fanatic, that the stroke of fortune fell. A little mongrel pup misjudged his distance and was struck by our front wheel. A policeman was for putting it out of its misery at once, but John refused. "I'll take care of him, officer, and if he can't be brought around all right, I'll see that he goes out easily."

"What the deuce," I began, and found my own answer before John replied. I remembered his talk about abnormal people—speeding up of brain vibration. . . .

"Brain *power*, Uncle Dick. There's where we've been on the wrong track. The pigs and the rabbits, of course, wouldn't do. No real brains. This pup must have brain to survive. Ray too much for weak mentality—burns it out like a lamp-bulb—too much vibration—force—whatever you want to call it."

IT is interesting to note that during all these days of failure after failure in our tests, the scientist ruled absolutely. Not once did we wait for a full view of the garden—and of her. I spoke to John, and questioned. His reply was indicative of the man, of his driving purpose, and of his faith.

"She knows—and I can't waste time."

THE puppy died on the table like the other martyrs, but we *saw him!* Only for an instant or two, after the Ray had been on for almost "visual" time. That is, just as the garden was beginning to appear, the dog glowed like a lump of phosphorescence. I thought first that it was only an illusion, a phantom of the blackness; but John saw it too—a will-o-the-whisp of light that waxed to a real visibility and then snuffed out instantly. John jumped for the light panel, flashed it open, and the little body was just relaxing in death.

"Poor little chap," I said.

"God bless him," cried John, exulting. "And just remember that this small, insignificant morsel of dogdom has achieved a real immortality today. We're right, Dick, (and for the first time he omitted the Uncle) we're right. Just enough mind to stand the Ray for a bit. Now for a grown dog—developed—trained, if possible—real mentality—and then I'll . . ."

"We'll get the dog through first, you can bet," I said with some determination, "and more than one, too."

FOR days we hunted. From dog fancier to dog trainer, until our search seemed hopeless. Many times, indeed, we found exactly the combination we must have, but strange to say, the owners of the dogs were unreasonably unwilling to give them up.

At last, far out in Westchester, we found him. A

great, full-chested Chesapeake, a throw-back both in color and in disposition, for he was as black as the pit, and a devil out of hell. The kennel man was preparing to shoot him as we came; that may give some idea of his disposition.

"Would I sell him? I would not, to anny wan. 'Twould be murther, an' on me conscience for manny a day. Oh! yez want him to experiment wid? That's diffrunt, but yez'll find it some experimentin'. 'Twill save me the throuble of buryin' him, at the best. 'Tis shootin' him I shud have been this two months or more, but the divil of a mind of him that looks from the two eyes of him would have put the murther feel on me. If he wurrant a sheer divil, he'd be human, he wud—he's no dog; he knows too much for the soul that's in him."

I thought of Kipling's Bimi.

We couldn't have been better suited, and for myself, I was glad that it was an animal fiend like this that we were to put out of the way, for I was growing heartsick, and I think John was too, over the slaughter of helpless, harmless creatures. It was with some sense of relief that, after a tremendous struggle, or rather series of struggles, we got him to the house, upstairs, and securely tied in a corner of the laboratory. We left him some water for the night, but neither dared do more than loosen the muzzle so that he could drink. To feed him was out of the question.

"If tomorrow doesn't bring sun," said John, with that wry smile of his, "one of us will *have* to feed him, and I for one don't relish the job."

We didn't have to take off the muzzle. The morning broke clear and bright, and when the sun had risen to its proper height, it poured down more than the light we could need.

At the earliest moment, we were in the laboratory. The great, black beast snarled at us from his corner, and as we approached him, leaped, straining at his bonds, the demon spirit glaring from his eyes and flashing from his huge fangs. Never had I seen such personification of wilful, implacable hatred.

It took the combined strength of both of us to put him on the table. Had it not been for the strong muzzle, we should never have gotten him there alive and conscious, and under no other condition would he have been of use to us. At last, he lay snarling out his anger, lashed securely, his head toward the projector.

"Heaven help us if he breaks loose," I thought. "Even with that muzzle he'll be worse than before. Then he was only hate; now he's murder itself."

John had turned to the machine. I noticed that he was fumbling nervously with the adjustments. That alone was enough to show the concealed tension under which he labored, for every part was perfect, as he well knew. But it is only in retrospect that I can see how much his cool demeanor was a cloak for his seething emotions. Only once had I spoken to him of the hope of the experiments, and since then I had been caught by his spirit of work to an end—the spirit that had borne him through his years of disappointment—and all other great scientists, for that matter.

And now, in looking back to those last hours, I can see that during all those days of failure after failure, each day met with a calm that was so thoroughly convincing, every nerve of the man must have been vibrating with an agony of hope, with an intensity equal to that of his marvelous Ray. The wonder of that self-control, the patience of that determination, after the one momentary break, gives perhaps a better picture of the man himself than has been presented in all his biographies.

And I am glad to remember the evident nervousness of those last moments—it puts him less far above us, away from us. It brought home to me too—that is these last few days—the meaning of that phrase, so often misused: "the love that passeth understanding."

"Everything must be all right," he muttered to himself at last, and faced me with a pathetic attempt to conceal his eagerness to begin. He held out his hand. "If this doesn't go, Uncle Dick, we're wrong, and then there is but one way left. If so, good-bye, and thanks for the help. The scientist in me tells me that we shall succeed; but I'm a heart-hungry man—hungry for years—and I'm afraid. I don't know why, but I'm afraid. Something is going to go wrong—and—— Well, let's go!" I saw his hand tremble as he reached for the lever to close the light panel.

The wait in the dark was cut short, I am sure; though it was interminable. I heard John whisper: "It must be time," and then the rasp of the switch.

The dog devil on the table had been raging against his bonds. Between the deep-chested growlings, that were deafening in the enclosed space, we could hear him struggling. The silence and the blackness had quieted him for a moment, but at the sound of the mirror lever, he broke forth again in a terrible throaty howl. I mentally tied again every knot that held him to the table; a devil from hell indeed. Suddenly a quaver crept into the horrible sound, and then it swept swiftly up the scale to the shrillest of thin trebles, like the faint far note of a bird—held there for a fraction of a second—rose still higher—and vanished beyond our hearing.

"It's the Ray," whispered John. I could feel him tremble in his chair. "It's the Ray working on sound, before we can even see it. He's growling yet—hear him thrash around—but the vibrations are too high for us to hear."

"Look!" I cried. "There's the beginning of the glow."

But I was wrong. This was not the eerie ghost-fog that preceded the visibility of the garden; this was a true glow—a light that we could see, for I found that I was peering over the top of my translating lens, not through it. There it hung in the blackness, indefinite and flickering at first, another phosphorescence—another will-o-the-wisp. More and more distinct it grew, by unnoticeable gradations, till it passed from the indefinite to definite. It was roughly oval in shape, and as I watched, filaments of light sprang from it and grew away from me. I bent quickly to the lens—and saw nothing! I raised my head, and the queer shape shone clearly.

"John, what's that? Look over the top of your lens."

"Pray God I'm right, Dick—that's the brain of the beast. That's proof! I knew the Ray couldn't work except on a high tension nerve system. Look! Look at the nerve filaments taking up the vibrations. If the brain of a dog can stand it——!"

Moment after moment, we sat staring, forgetting everything in the glowing brain of a dog. I cannot begin to write of the pitch to which we were wrought. I could feel myself tremble, and could sense the mad hope that must be springing into John's heart. Brighter shone the quivering mass of light, and, as it increased,

I noted the perfect "crescendo" of shading, from reddish to orange, the softening to a golden yellow; and, then, about the violet nucleus, the faint suggestion of the form of a dog. The tissues of the body were beginning to respond to the Ray!

I could hear John's gasping—his breathing quickened to a sobbing pulsation, and over and over again: "God! if it lives—God! if it lives—"half expletive, half prayer. And then, a groan of despair that was echoed in my own heart. The glow had begun to fade! The beast was dying, as had all the others! I could not bear to watch the quick extinction that would mark the moment of death—and failure—, and sank back behind my translating lens. I must have looked for some time before I knew that I saw. The Ray, while we had watched the dog over our lenses, had done its work unnoticed by us. There lay the garden in all its real unreal beauty.

It was the movements of the tree-branches that caught my consciousness. They were in the strangest motion, waving and dipping toward the shimmering surface of the pool, beyond the edge of the Field—sweeping up suddenly, only to return downward in curving grace. There was an effect of play about it. And the flowers in the great bed about the bench swayed beckoningly toward the pool, as if begging to join in the romp. Then, flung across the bench, I saw the draperies of her garments—and I knew. Forgotten now the laboratory, the dog, the failure, and even the agony of sympathy for John.

A ripple of water, and the swing of the branches, heralded her coming. Into the Field she swam, her hair a cloud of floating glory about her. Like some nymph of fabled time, she frolicked in the crystal liquid, catching at the branches that teased just beyond her reach, eluding with fairy grace and speed others that sought to trap her—diving, swooping through the water, like a swallow playing in the air.

I sat oblivious of all else—I wasn't seeing, I was *living* the melody, the perfection of harmony in beauty unrestrained; and then John spoke:

"This is the end, Uncle Dick. I can't carry on. Would to God I had never tried. There is only one thing left."

He must have been sitting, watching over his lens—watching his hopes die with the fading of the glow on the table, and then, as he finished, he must have dropped in his despair behind the translating lens, for a choked sob of unutterable longing burst from him. To my shame, I must say that my feelings at the time were only extreme irritation and annoyance at the interruption.

A moment's more play—if there were only a proper word—and then the branches swung down to her appeal, folded her within them in a combined caress, lifted her to the edge of the pool, and retired reluctantly. Just for an instant, she stood before us, with arms uplifted in sweet abandon, the wonder of her beauty set like a jewel against the dark trees; just an instant of time and yet an eternity of revelation—a swift run through the adoring flowers, and the draperies, swept shimmering from the bench, veiled from us the utmost purity conceivable in the mind of man.

John muttered something in his agony. I barely heard him. She had flung herself upon the bench, her head upon her hand, her wistful eyes full upon us. Again, I could feel that soul cross the gulf between our worlds, and cleanse me from the evil of mine; and then, between us appeared a misty cloud. I saw her eyes grow wide with amazement, saw her rise quickly, and take a half step toward where this luminous fog-ball, thickening rapidly, hung above the ground of the garden. In that second, the mist took shape—the dim, distorted figure of a dog!

A great surge of triumph rushed over me: the animal was not dead—the experiment was a success!

Yet even in this tiny part of time, as the blurred and evil outlines became clear, knowledge and horror seized me.

"Great God! John," I cried—I screamed—gripping him madly in the blackness, "the dog has gone through—we have loosed that devil upon her!"

He started from under my hand, and I lost him—for the dog-mist solidified before my eyes, mesmerized with terror—dropped heavily to the ground of the garden, and launched its huge body straight for the white throat! My brain reeled—a terrible cry from John—a thunder-clap—and a brutal blow across my face!

Stunned and almost blinded, I struggled to my feet groping desperately in the blackness for the lens and its bar against which I had been thrown. I found it, bent and twisted, and in an agony worked to straighten it. I must see! I cried aloud to John. No answers! I must see—hurt or no, he must wait.

Yet even as I struggled with the bent arm of the stand of the lens, I became aware of a brightening glow in the center of the room. Then, I saw him! Vibrant with light, he stood in the full influence of the Ray, each part of him scintillate with motion—and his face a glory of triumphant ecstasy. I thought I saw his lips move: "Good-bye." The glow faded, and the blackness of that awful laboratory dropped upon me with its smother.

The fear of not knowing forced me to look—and there was no need of fear. I should have known. She stood eagerly waiting, one hand resting on the head of the black devil, who gazed up at her adoringly. Waiting she was, watching something I could not see, and the wonder of her was unbearable.

I could not see—but I knew! Then—there it was—the ghostly mist—the thickening—the wraith of John Forsythe—and her arms outstretched?

Even before his *reality* I saw him falter toward her—saw the exaltation of his face—and then the explosion—the hurling forward—the desperate clutching at the blackness, as I fell.

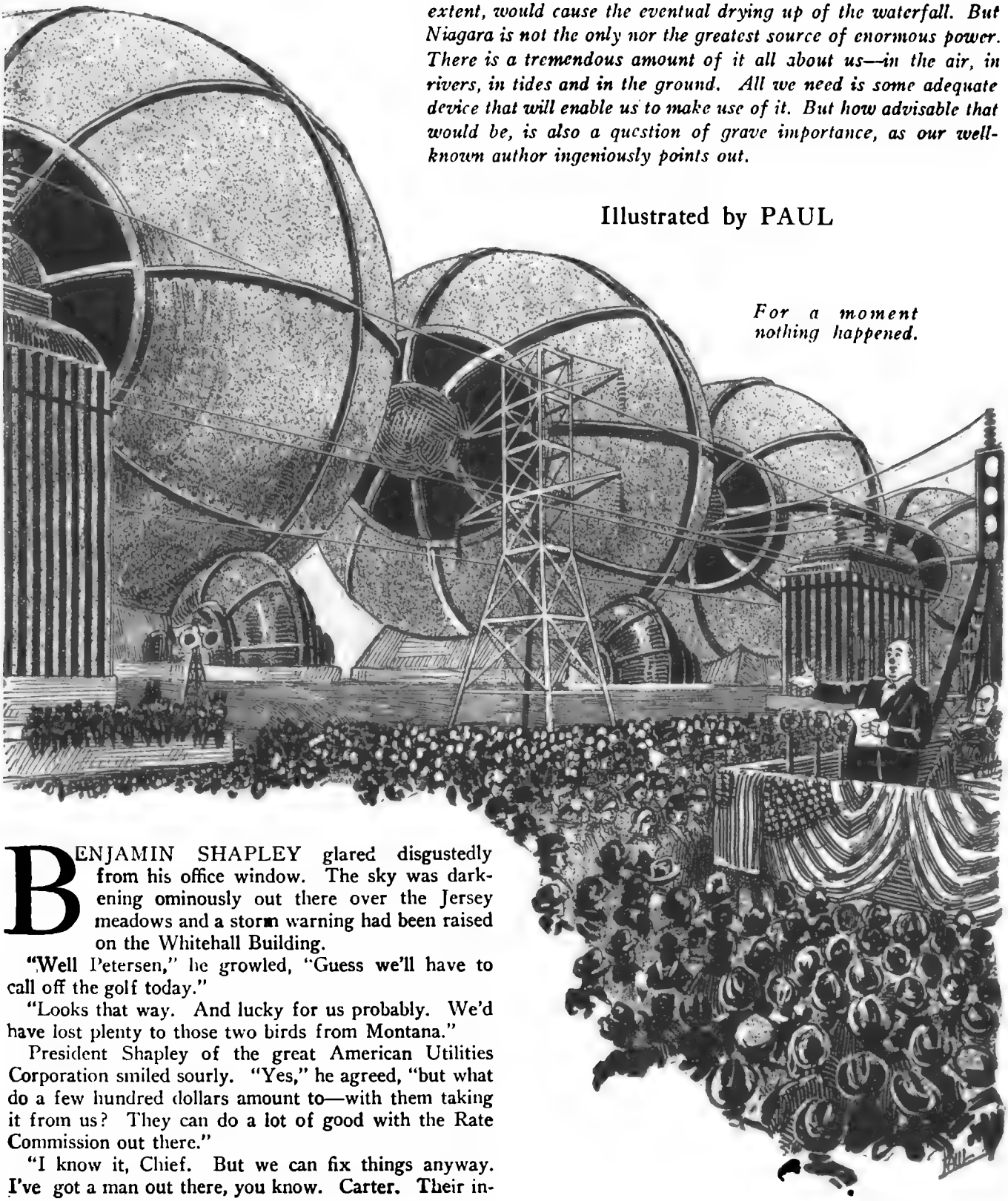
THE END

Free Energy

By Harl Vincent
Author of "The Golden Girl of Munan," "Explorers of Callisto," etc.

THERE is much discussion about the advisability and practicability of harnessing much more of the tremendous power of the giant Niagara for use in generating electricity, which residual power in the opinion of a great many authorities, is absolutely wasted now. Such procedure, carried out to its full extent, would cause the eventual drying up of the waterfall. But Niagara is not the only nor the greatest source of enormous power. There is a tremendous amount of it all about us—in the air, in rivers, in tides and in the ground. All we need is some adequate device that will enable us to make use of it. But how advisable that would be, is also a question of grave importance, as our well-known author ingeniously points out.

Illustrated by PAUL



For a moment nothing happened.

BENJAMIN SHAPLEY glared disgustedly from his office window. The sky was darkening ominously out there over the Jersey meadows and a storm warning had been raised on the Whitehall Building.

"Well Petersen," he growled, "Guess we'll have to call off the golf today."

"Looks that way. And lucky for us probably. We'd have lost plenty to those two birds from Montana."

President Shapley of the great American Utilities Corporation smiled sourly. "Yes," he agreed, "but what do a few hundred dollars amount to—with them taking it from us? They can do a lot of good with the Rate Commission out there."

"I know it, Chief. But we can fix things anyway. I've got a man out there, you know. Carter. Their in-

vestigation will not look bad for us." Vice-President Petersen winked knowingly.

"Well I suppose so. But I like to see every possible angle covered. There's a cool hundred million in it for us if the new rate schedule is allowed."

Benjamin Shapley tapped the arm of his chair with nervous fingers, then reached for a button at the edge of his mahogany desk. His call was immediately answered by his secretary, who entered the door noiselessly.

"Make us a couple of highballs, Mahoney. And, tell me, have I any further appointments?"

The secretary busied himself with decanter and siphon. "You have no definite appointments for the afternoon," he said, "but Mr. Huxley is still in the outer office."

"What? Is he hanging around yet? I've sent word a dozen times that I couldn't see him. Didn't you tell him to see Martin?"

"I did. But he says the Engineering Manager won't do. Insists he must see you personally."

"Well, I'll be damned!" exploded Shapley, indulging in a wry grimace as he drained his glass, "The fellow has a nerve at that!"

"Who is it, Ben?" inquired Petersen.

"Some hick engineer from one of our properties upstate. Been hanging around New York for three days now, insisting on seeing me. Has an invention, he says—revolutionary to the power industry and all that old bunk."

"H-hm. And he won't talk with Martin, eh? Well why not let him in and we'll kid him a little? Have to have some sort of entertainment today."

"Oh, be yourself, Pete. I got over this business of listening to every crazy inventor that comes along—years ago. Time's too valuable."

"Yeah. Sitting here doing nothing. Come on, Ben, let's see him. Send him home happy—or fired."

"Oh, all right. But you can do the kidding. I won't. And, if he's too crazy, out he goes." Shapley yawned and turned to his secretary. "Send him in, Mahoney," he sighed, "and phone the Engineers' Club. Tell the Commissioners we'll see 'em for dinner at seven-thirty. Sorry about the golf—oh, you know what to tell them. Go ahead."

Leroy Petersen laughed. "You're getting lazy, Ben," he said, "too lazy even to enjoy a good smile."

ALAN HUXLEY was not particularly discouraged. He had cooled his heels before in the outer offices of Wall Street notables. Of course, there was none as great as Shapley, czar of the power combine, but he felt that eventually he would get to him. It was only a matter of staying around long enough. Then the Kilowatt King, as some facetious writer had termed Shapley, would see him to get rid of him. If not, there were other ways of getting to him. But Alan hated to resort to these.

When Mahoney told him that the great man would see him, he grinned appreciatively. "Told you so!" he gloated.

As he walked into the office of the great man he was still smiling. So was Roy Petersen. But Benjamin Shapley was not. He sat slouched in his chair, elbows on the desk and his brows drawn together in a menacing frown.

"Well, gentlemen," said Alan brightly, "here I am. I appreciate your granting me an interview, too. But you'll not be sorry, for you are about to have the privilege of acquiring the most revolutionary invention the power industry has ever known."

"Hmph!" grunted Shapley.

But Petersen continued to grin. He rather liked this nervy young man and he hugely enjoyed the discomfiture of his boss.

Alan Huxley was drawing a glittering object from his pocket. Solemnly he deposited it on the desk.

"My God!" exclaimed Shapley. "It's a toy gyroscope!"

"Exactly," agreed the young inventor, "And that simplifies matters—your instant recognition of the toy. I'll not have to spin it."

The Kilowatt King seemed on the verge of apoplexy. "Are you trying to make a fool of me, young man?"

"Certainly not!" Alan Huxley spoke with dignity. He leaned close and confidentially whispered, "I'm trying to make you the richest and most powerful man in the world. I can do it, too, if you'll listen to my story."

"Spit it out, then!" snapped Shapley.

Petersen saw that the boss was interested in spite of himself.

"Mr. Shapley," Huxley said, "I have positive means of obtaining power—electrical energy—without the use of fuel of any kind and without harnessing the energy of the sun or the rivers or the ocean. In other words, I have a source of free energy—absolutely free, excepting for fixed charges on the investment."

He paused impressively.

"Lord, Pete!" moaned Shapley resignedly, "He's another of the perpetual motion maniacs!"

"Not in any sense of the word!" countered the inventor, "We all know that perpetual motion, in the accepted meaning of the expression, is impossible. Useful energy can not be generated without tapping some reservoir of potential energy; burning fuel to obtain heat, or getting the heat from the sun or the internal temperature of the earth; using the kinetic energy in the waterfalls of nature or in the waves of the ocean. No, this is not perpetual motion of which I am speaking. I have merely discovered a vast source of natural energy which never has been tapped. Likewise I have found a means of tapping it at very little cost."

He spoke convincingly. Benjamin Shapley had ceased frowning and his cheeks had resumed their normal hue, which was something short of the purple of imminent apoplexy. Roy Petersen no longer smiled. Both were interested.

"What is this source of energy?" asked Shapley.

"The rotation of the earth!"

"What?"

"Nothing else but." Huxley was fingering his toy gyroscope. "This little toy," he said, "is an interesting thing. Larger ones are used for many purposes—on shipboard, for compasses and stabilizers; in our ships of the air for the same purposes and for keeping them on a true course without manual control. The principle is the same in all cases. A rapidly spinning rotor of considerable weight tends to rotate with its axis in the same plane regardless of external forces that may be applied. It resists these forces with tremendous reaction. Such a reaction from a tiny wheel that can be housed in this room is sufficient to keep the largest ocean liner from rolling badly in the heaviest seas."

"What has this to do with the rotation of the earth?" asked the Kilowatt King. He was respectful now.

"Just this. Gyroscopic phenomena are the result of the action of forces as best described in Newton's First Law of Motion. Every body continues in its state of rest or uniform motion in a straight line unless compelled by external forces to change that state. In the case of the gyroscope, the tendency is to maintain the direction of the plane of rotation in space, and the direction of its axis in space. You'll note that I said in *space*, gentlemen."

"Yes, yes, go on!" Shapley was all attention now.

"Here is where we take advantage of the tremendous force of the earth's rotation. This gyroscopic inertia, of which I speak, will cause a gyro axis apparently to rotate about a line passing through its center and parallel to the polar axis of the earth. This apparent motion has a daily period, of course, but its force is enormous and by means of suitable gearing we can speed it up to a value where it can be used to drive the ordinary sixty cycle alternating current generator. Do I make myself clear?"

"In principle, yes. But, have you worked out the economics of the thing?" The Kilowatt King was growing excited. Roy Petersen grinned anew in enjoyment of the situation.

"I have, Mr. Shapley. Listen—and correct me if I make any misstatement regarding your present costs. Your average steam generating station costs about a hundred dollars per kilowatt of rating to erect—its fuel averages four dollars a ton. The hydro plants cost twice as much, but the cost of the fuel—water power—is zero. Operating costs in both cases are involved, these being higher in the case of the steam plant. The net results are power costing you about three-tenths of a cent per kilowatt hour for the modern steam plants and something over half of that for the hydro-electric stations. You sell it to large consumers for a half a cent or, if they are real nice, four-tenths of a cent. Out in the sticks, the small user pays as high as fourteen cents. Of course, the cost of transmitting power over long distances enters into this as well. Am I correct?"

"Roughly so. At least you are close enough for all practical purposes. But go ahead, man, go ahead!" Shapley was impatient.

"All right. Now, I'll tell you that a gyro plant can be put on your lines in complete operation, building it from the ground up and including the cost of the ground, for less than fifteen dollars a kilowatt rating. You have no operating costs—it runs itself—and maintenance and repairs are negligible. You can put its available power on the line at a cost not to exceed three one-hundredths of one cent per K. W. H. Get that! A tenth the cost of your steam power, a seventh that of the hydro. The ratio of power output to input is the same; ten to one. In other words, you can take one of your present hydro plants of a million kilowatts total capacity build a gyroplant of ten millions capacity right alongside and run it from the old plant. You multiply the power output by ten, but decrease the cost of a unit of that output to less than one-ninth of its present cost. Think of it!"

Think of it indeed! Shapley was stunned by the figures. So was Petersen. Alan smiled triumphantly.

"Proof! You have the proof of these statements, young man!" gasped the power magnate.

Alan slapped a sheaf of blueprints and a book of calculations on the desk. "There they are," he said simply, "I'll leave them with you. Let your engineers consider them carefully. I'm not afraid. My patents are ironbound and basic. Even the great American Utilities Corporation can not get around them. That's how sure I am."

Shapley's eyes narrowed. "And your price?" he asked, with just the least uplifting of his eyebrows.

"Ten million, flat!"

"You're crazy!" bellowed Shapley, "You've nowhere else to sell it!"

"Haven't I? Well, Mr. Shapley, let me tell you this: There are other engineering organizations in North America; other moneyed interests. Besides, there's much feeling against your outfit; a monopoly and all that. Think I couldn't get money put into this thing if I went after it that way? Think I couldn't make it hot enough for your crowd, so you'd have to reduce rates throughout the land? Think it? Why, you know dam' well I could! What's more, this is your first and last chance. I'll give you three days to investigate and think it over. Then I'll be back for a certified check. You know the amount!"

Alan Huxley was backing toward the door as he spoke. On the last word he slammed it—from the outside.

Jerry Mahoney stared after him in amazement as he rushed through the outer office.

THREE days later young Huxley walked out of the same office in an entirely different manner. He had resigned his position up-state with the small subsidiary of A. U. C. But in his breast pocket there reposed a certified check in the amount of ten million dollars. True, he had sworn himself to secrecy in the matter, but that had been no hardship. As a matter of fact, it fitted in with his own ideas very nicely. Shapley had purchased his patents from his own personal fortune.

Things began to hum in the headquarters offices of A. U. C. The engineering department force was trebled and lights shone late at night from many windows of their building, high above the street. Material specifications were issued to the large manufacturers of electrical equipment and their high-pressure salesmen soon were to be seen around the place in droves.

Steel mills and foundries received orders for forgings and castings of unprecedented size. Enormous lathes and boring mills were needed to machine the huge castings, so machine-tool manufacturers shared in the business which was being handed out by A. U. C.

Rumors of the activities brought newspaper reporters to the office of Benjamin Shapley in such numbers, that it was hardly within the power of the doughty Jerry Mahoney to shoo them off. Two husky patrolmen were assigned to the task by the Police Commissioner. And no definite news of the plans leaked out. All that was known was that the power combine was engaged in some huge new operation that would either cheapen power or produce it in vastly increased amounts. The subject became one of discussion on the floor of Congress. There should be an investigation—undoubtedly.

On the floor of the stock exchange there was much buying and selling of A. U. C. common. Its price rose to dizzying heights and the entire list went with it.

President Shapley spent very little time on the golf

course during these strenuous days. Every available hour was needed at his mahogany desk. But his supply of Scotch required replenishing with increasing frequency—and he showed its effects. He was keyed to his highest pitch.

Huge excavations began to make their appearance in the vicinity of a number of the large power developments of A. U. C. In the state of Washington, in Arizona, in Alabama and in Canada additions to already large plants were going forward with amazing rapidity. Long stretches of high tension transmission lines were being increased in capacity by the installation of additional and larger cables.

Then there came a startling announcement that was released to the press from Shapley's office. On and after September first, 1988, the rates for electric service were to be reduced! Ten per cent to small users. Think of it! And a sliding scale for increased consumption. The more you used, the less you paid—per kilowatt hour.

Small users made haste to purchase additional consumers of electricity; fans, flatirons, toasters, radiant heaters—everything in the world that went to make up the merchandising product of the manufacturers. Power consumers in industry hastened to motorize every possible piece of moving apparatus in their factories. The demand for service grew to unprecedented proportions. More prosperity!

Benjamin Shapley was more than pleased. He was jubilant. In his foreknowledge of coming events he had bought heavily into the industrials, who now were profiting so greatly. He was a director on no less than twenty boards and, more than ever, a power in the land.

Bit by bit the nature of the marvelous new mechanism was fed to the newspapers. Free energy became the topic of daily conversation everywhere. But the enormous savings to be effected remained carefully hidden from the prying eyes and ears of the general public. It was all right for them to think that A. U. C. was doubling its generating capacity and could thereby reduce rates a considerable amount. But the cost of the improvements was enormous, so the story ran. Of course this was true—in dollars—but it must never be known that the expenditures were of infinitesimal amount in proportion to the vast profits to be gained. Benjamin Shapley played his cards with a master hand.

Eventually there came the day when the initial installation of the new equipment was to be tested. On the Canadian side of Niagara Falls, a few miles inland, there rested the ten great domes which covered the gyros of the first plant to be completed. From the huge steel framework that housed the transformers and high potential generators, there stretched, switching overhead, a myriad cables of shining newness—lines that would feed the vast new supply of energy into the super-power system of North America.

Three-quarters of a million kilowatts generated by the hydraulic turbines at the Falls were to be turned into the massive motors driving the ten gyros. Ten times that amount of energy was to go singing over those new cables at the touch of a single button.

President Shapley was there in the company of many government officials who had been invited to attend the ceremonies. But his was the most imposing figure among them. True, he was a bit unsteady on his feet and his voice was thick with emotion, or with something known by the misleading term "Scotch," but he was easily the outstanding personage—King of the Kilowatts.

THE first gyro started easily, but its thousands of tons of rotating weight required several hours in coming up to speed. Then the power needed to keep it spinning in its evacuated casing would reduce to its constant value.

One after another the huge machines were started and soon the mighty power of Niagara was diverted to the task of bringing their massive rotors to full speed. Not yet had mother earth begun her work. That would come later, when the ten machines were operating at synchronous speed and their main switches closed.

Invited guests and crowds of the merely curious pressed closely around the platform which had been erected for the celebration. The band had ceased its raucous uproar. President Shapley was speaking; reading in jerky sentences from a paper that fluttered insecurely in his trembling fingers. Much of that paper had been copied verbatim from Huxley's original description of his invention.

"A new era in the onward march of civilization," he read, "an era of unlimited power; cheap power. The tasks of mankind taken over by the power that flows over small wires, which spread throughout the land—wires that enter every factory, every mine, every home. In these great wheels lie the ability to harness the greatest force available to man, the vast inertia of our own earth. From the mighty cataract which roars so close at hand we are taking the energy stored in Lake Erie and the Niagara River by the precipitation of moisture from our cloud-filled atmosphere—moisture that was originally evaporated from our lakes and rivers by the heat of the sun. A simple cycle of nature, known to us for many years. This power fed to mighty motors, rotates the massive rotors of our gyroscopes in a vacuum that approaches the theoretically perfect. These enormous rotors are mounted on practically frictionless bearings, floating in mercury, as do the supports of the great telescopes in our astronomical observatories.

"The giant gyroscopes tend to maintain the position of their axes in space, the space of the universe. But the earth rotates beneath them, so we obtain a relative motion that is utilized in driving new generators of unheard-of capacity. Ladies and gentlemen, each of these gyro-driven generators turns out ten times the energy that is required to spin its rotor. This vast increase is made possible by the hand of the Almighty, the hand which turns our good old world on its axis. No expenditure of fuel is needed; our steam generating stations all will be shut down. Coal and oil will be conserved for other uses.

"An unlimited source of power is now available and at considerably reduced cost to the consumer. Of course the expenditures in money have been enormous; the carrying charges on the new equipment will eat up most of the profits from the otherwise free energy. In time however, as more and more of this form of energy is used, the costs will be reduced. Investments eventually will be written off. Then will come the ultimate in power consumption, the minimum in cost. Rates probably will be half of what they are at present, possibly even less."

A storm of applause interrupted the speaker and he stood with smiling, perspiring face, blandly accepting the

plaudits of the crowd. Not so bad at that, this Utilities outfit! General opinion always had been that they were profiteers and thieves. But here the great monopoly was doing something for mankind! Reducing the cost of the most essential necessity of modern life—of their own free will. The cheering swelled anew as excited comment ran riot. It was a great occasion.

Soon there came a flash from the luminous signal board over the platform. The crowd hushed its demonstrations. Two of the marvelous new generators had been synchronized. Each was running at normal frequency of sixty cycles per second. Another light flashed, a fourth and a fifth. The silence was that of a tomb.

A wave of nausea took hold of Benjamin Shapley. What if the vast project was a failure? But it couldn't be! The calculations of his engineers checked with those of Huxley. In fact, they were even more optimistic in their results. Then there was the test of the tiny model they had built. No, it couldn't fail! He bucked up once more; wished he dared to take a swig from his silver flask. Just one swallow!

Nine of the indicating lamps were now aglow. Then the tenth flashed into brilliancy. The entire group of generators was now in synchronism. But not with the system. There still remained the task of paralleling them with those thousands of others of the older types which hummed so steadily all over the great superpower system of A. U. C. A siren shrilled startlingly. The load despatcher at the main switchboard was signalling that the local generators were now in step with the vast system they were to serve. All that remained was for Shapley to press the tiny gold button on the speaker's table.

Cold perspiration oozed from his brow. The watchers held their breath in anticipation. Then with a resolute motion the Kilowatt King depressed the button with his pudgy thumb.

For a moment nothing happened. The huge main switches were being closed by their operating relays. All eyes strained to get a view of the large illuminated dial of the wattmeter over the platform, the meter whose graduations were carried to a maximum of ten millions of kilowatts. Its huge hand flickered; then jumped perceptibly. The ground trembled beneath their feet. A woman smothered a scream. The despatcher was bringing up the loading gradually. *He* was afraid. Never in history had so great a single block of power been thrown on the system!

The hand of the indicating meter advanced steadily now and the rumblings in the earth increased with the load. Two million; five; nine! No! The hand swung back; oscillated a moment and came to rest at the eight mark! Eight millions of kilowatts! Nearly eleven million horsepower! No wonder the earth shook! But now, with the load stabilized, the tremblings ceased. After a surprised initial protest, mother earth had buckled down to her new job as though there was nothing unusual about it at all.

Pandemonium broke loose among the spectators and Benjamin Shapley found himself hoisted aloft and carried about on the shoulders of an hysterical mob.

WITHIN one week the second plant was placed in service with similar ceremony. In a month there were four in operation, but the ceremonies no longer were observed. Already the supreme accomplishment was an old story to the blasé public.

When the total capacity of the new plants had reached one hundred million kilowatts, there began to appear in the scientific press derogatory articles. A. U. C. was tampering with the forces of nature; forces that never were intended to be utilized. Supposing the earth should be slowed down by the enormous drain on its rotative inertia? Supposing even that the disturbance should reach a value where the conflicting forces would be of sufficient magnitude to throw it from its orbit?

Benjamin Shapley laughed at the calamity howlers. The idea was preposterous! Two more plants were placed in operation. A hundred steam plants had been shut down. Millions of tons of coal were being saved and the salaries of thousands of engineers and boiler room attendants. A. U. C. was making money so fast they couldn't keep track of it. The accounting department was working nights.

Someone was selling A. U. C. common in fairly large blocks—a thousand shares at 400 one day, a thousand at 398 the next. The Kilowatt King commenced buying once more. This was too good to be true. He sold all other holdings and prepared to sink every penny of his fortune in A. U. C. Already he controlled nearly sixty percent of the stock.

A black headline fully two inches high appeared in his favorite morning paper. Shapley had a dreadful hangover that morning and thought he was seeing things when it stared up at him from his place at the breakfast table:

"EARTH'S ROTATION SLOWING SEVEN SECONDS A DAY!"

What rot! He read further. The astronomical observatories had been investigating the phenomenon for weeks. The rate of deceleration was on the increase. At first they could not believe, but now there were identical data available from twenty-two of the observatories. It was an incontestible fact! At the rapidly increasing rate of deceleration in rotation, it would be less than three years to the time when the globe's rotation would have completely ceased. One side would always face the sun and become inconceivably hot. The other side, always facing into outer space, would become frigid; the temperature being estimated as 200 to 250 degrees below zero Fahrenheit. The world no longer would be habitable!

More than this there was a further danger which might cause the entire destruction of the terrestrial globe in a much shorter period of time. An inexplicable force was causing disturbances far beneath the earth's crust, shiftings of huge masses of the hot interior that were increasing the internal temperature rapidly. The rapidity of this increase would likely cause tremendous explosions probably an all-destroying one that would shatter the earth. Molecular friction they called it. The calculated expansion of the earth's core was at a rate that the crust could not stand. It must burst under the violently increasing internal pressure!

Benjamin Shapley cried aloud. Here was another article in which it was stated that the new generating stations of A. U. C. were responsible for the terrifying phenomena. It went on to explain the statement in scientific terms and with calculations to demonstrate its truth. The article was signed by Alan Huxley.

The Kilowatt King kicked over his chair in his haste to leave his untasted food. He must reach his office in nothing flat!

GREAT crowds were milling about in the streets as his high-powered roadster made its way downtown. Excitement already was running high. People were looking at the sun as if expecting it to stop dead in the heavens.

When he reached the office he found things worse. A mob of many thousands of people fought for entrance to the building. It required desperate efforts from the police to force a passage for him. Glowering looks and black threats greeted him as he passed. He was glad of the sanctuary of his private express elevator.

A white-faced Jerry Mahoney passed him through the doors to his own private sanctum, where he found Roy Petersen and most of the other members of the Board of Directors. They were in heated argument.

Shapley poured a half tumbler of whiskey and gulped it down raw. He sank into his chair with a moan of anguish.

"Ben," said Petersen ominously, "the President of the United States has telephoned."

"He has! What for?"

"To request that our gyro plants immediately be closed down. He did this personally in order to save time as Federal action can not be taken for several hours."

"Well, I'll be damned!" The King of Kilowatts slumped in his chair, staring vacantly at his associates. "What has been done?" he asked hopelessly.

"They've shut down. Half of North America is without power until the steam stations can be started. There's hell to pay, Ben."

"Anything else?"

"Plenty. Have you looked at the tape?"

Benjamin Shapley was galvanized into immediate action. He moved to the ticker and reeled off a few yards of the tape from the basket. A. U. C.—100 at 187—200 at 183—50 at 176. The little fellows were selling out. no! Here was 1000 at 169—another thousand at 152. God! It was a landslide. Suddenly he remembered that he held some twenty thousand shares on margin.

"Call my broker, Pete," he begged. The others were filing from the room in silence. It is not pleasant to witness the breaking of a man, however inhuman he may have been in the past.

"He's already called, Ben. Asked for more margin. But the stuff was slipping so fast he had to sell you out."

"Oh Lord!" groaned Shapley, "nothing but A. U. C. stock. How far do you think it'll go, Pete?"

"Frankly I think the bottom's dropped out entirely. It may hit almost any low mark." Petersen was kindly but discouraging.

"I'll fight 'em!" grated the King of Kilowatts, regaining some of his old courage, "I still hold fifty per cent outright. The shorts'll oversell. Then where'll they be?"

"Fifty per cent of nothing is nothing, Ben. I'd drop a little if I were you—just for pin money."

Shapley took another look at the tape. 99¼ the last sale! "Who the devil's selling?" he snarled.

"They say there's a mysterious trader—the guy who's been dumping thousand and two thousand lots for several days. Rumors are he's got it, too. Been buying it on the Q. T. No short selling here."

"I'll fight him. By the Lord Harry, I'll fight him. He'll go broke sooner than I if he owns the stuff. The price is dropping for him the same as for me." The president of A. U. C. was raging impotently.

"Up to you, Chief," said Pete, "But if I were you—these rumors you know—they may be a blind for a big short stampede. If it's a pool or a clever individual operator, you're busted wide open."

"I'll fight! I'll fight! I'll fight!" Benjamin Shapley poured another huge drink and sank into a chair, red-eyed and shaking.

Petersen turned his head. You couldn't do anything with the boss when he was in this humor!

FOUR hours later Alan Huxley strode into the room without so much as knocking. The outer offices were deserted anyway. There was no Jerry Mahoneys to stop him.

"Don't do it, Shapley!" he shouted from the threshold.

Startled, the Kilowatt King dropped the automatic he had pressed to his temple. It thumped harmlessly on the thick rug and young Huxley retrieved it instantly.

"What's the matter with you?" roared Huxley, "No guts? Take your beating like a man, Shapley. It was coming to you."

The big man's head was buried in his hands now. He sat at his desk a shaken, broken man. Alan regarded him in contemptuous silence.

Finally the financier looked up. His eyes were those of a whipped dog. "Guess you're right, Huxley," he whispered huskily, "I'll take it. I was crazy a moment ago. You did this to me, young man, didn't you?"

"I did." Alan's voice was chill, unyielding.

"Why?"

"Because, Benjamin Shapley, you did the same thing to my own father some twenty years ago. When A. U. C. acquired those properties upstate. Froze him out—broke him. He didn't face it like a man either. Did what you tried a few minutes past—and no one was there to save him. I was a lad of twelve and I swore I'd get you—give you a dose of your own medicine. I've kept my word and now I'm satisfied. I'll never bother you again."

"You knew the gyros would cause the trouble they did?"

"Certainly. It was a mere matter of calculation. Your own engineers could have discovered it in the beginning, had they gone far enough with their figures. But I banked on your cupidity, Shapley, and I won. Your men told you that the earth's inertia would be used up in time, but they figured it would require many decades, so you figured you could reap the harvest before there was any real danger. But they figured only on the mechanical inertia, as I knew they would. They forgot the effect of internal stresses which are what really speeded up the action so tremendously. It was a very natural error—oversight, rather."

"I see. And the raid on American Utilities stock?"

"Likewise the work of the avenger. I used the ten millions to swing it. But it was a huge success, Shapley."

"I'll say it was." Shapley was calm now, calmer than he had been after Pete deserted him.

Alan looked at the man pitying. But his years' old resolve kept him firm. Shapley was gazing from the window now, into the late afternoon sun. He was entirely sober. Alan waited for him to speak.

(*Continued on page* 566)

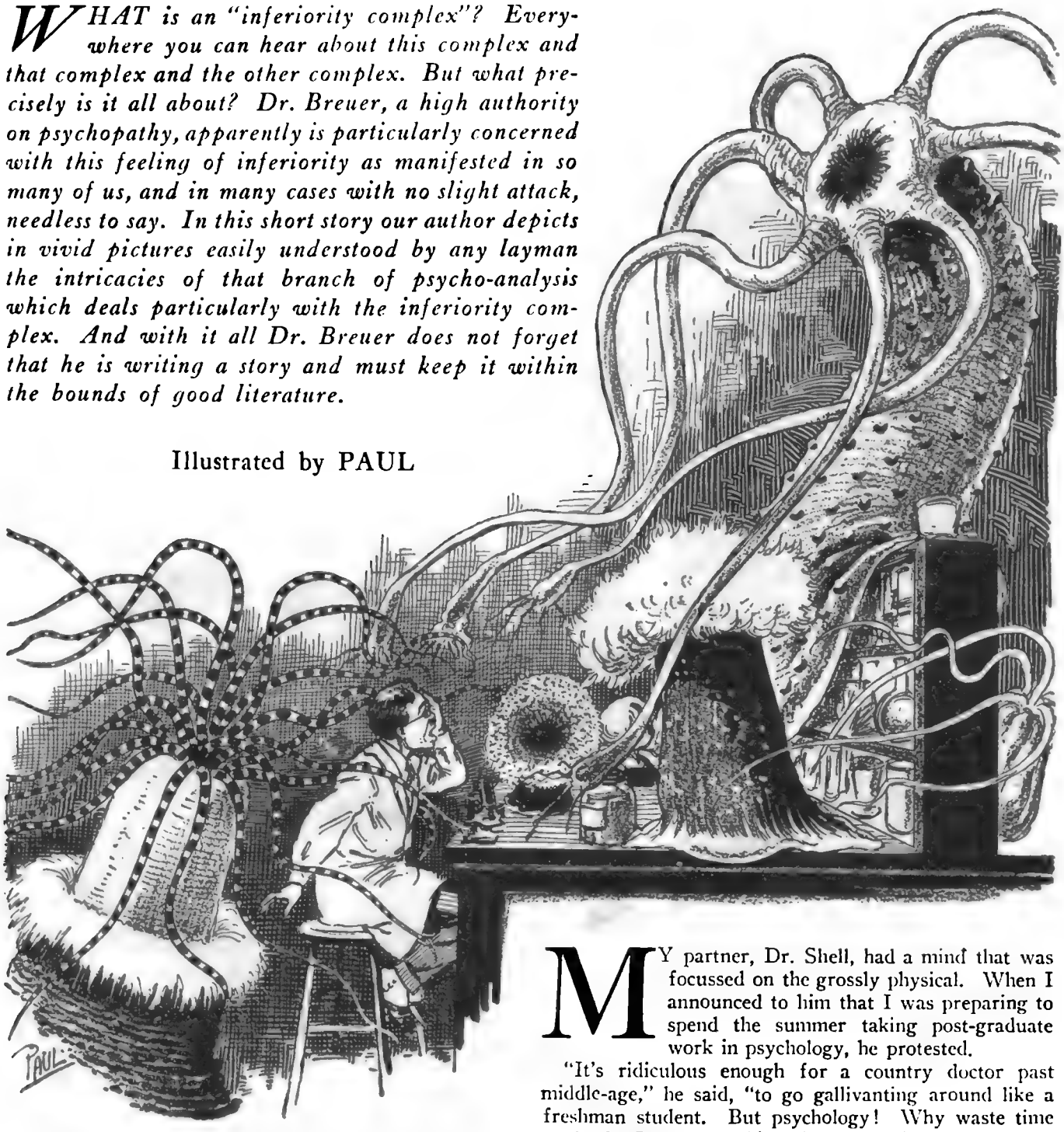
The Inferiority Complex

By Miles J. Breuer, M.D.

Author of "Driving Power," "The Gostak Distims the Doshes," etc.

WHAT is an "inferiority complex"? Everywhere you can hear about this complex and that complex and the other complex. But what precisely is it all about? Dr. Breuer, a high authority on psychopathy, apparently is particularly concerned with this feeling of inferiority as manifested in so many of us, and in many cases with no slight attack, needless to say. In this short story our author depicts in vivid pictures easily understood by any layman the intricacies of that branch of psycho-analysis which deals particularly with the inferiority complex. And with it all Dr. Breuer does not forget that he is writing a story and must keep it within the bounds of good literature.

Illustrated by PAUL



"See how that hydra would like to seize me. And see how many of them I have in the laboratory. All my days belong to these creatures."

MY partner, Dr. Shell, had a mind that was focussed on the grossly physical. When I announced to him that I was preparing to spend the summer taking post-graduate work in psychology, he protested.

"It's ridiculous enough for a country doctor past middle-age," he said, "to go gallivanting around like a freshman student. But psychology! Why waste time at that? Study something that will help you take care of sick people!"

I smiled. Already I knew enough of psychology to in-

terpret the fundamental reason behind his annoyed protest. For three months during the hot summer, he would have to scurrry around taking care of his patients and mine also. But, that was our agreement; I had relieved him when he went on his Hudson-Bay hunting expedition.

However, he himself wasn't even conscious of why he was so irritated at my fixed intention of studying psychology.

"I have previously suggested to you," I reminded him gently, "that you can't take care of people's bodies unless you know what is going on in their minds."

"Hifalutin' theorizing!" he muttered. "Fine-spun, abstract stuff for a lot of city guys who are too spiffy to get down to real work and to do some real, honest-to-God medical drudgery."

"You'll admit I'm not strong on rubbing it in," I said slyly; "but who can resist a chance like this? What about Henry Giesler's girl? A whole year you treated her for tuberculosis, until I pointed out to you that all she had was a fear-complex because her aunt had died of it. Just a little explaining one afternoon cured her tuberculosis."

"Aw!" said Dr. Shell. "Hem!"

"That's psychology! Or, remember Abe Slosser's sores? Six doctors treated them for four years and couldn't heal them. Until I dug into his mind, and found he was making them himself, faster than you could heal them; because he was depressed, melancholy. Had an *inferiority complex;* so disgusted with himself that he was punishing himself."

Dr. Shell made a sound like a snort.

"Or," I continued, "Maitland, the banker. You and Brown and Hayden all thought me a harmless crank, when I kept warning you about him. I noticed his 'delusions of grandeur' a year before the bank failed, but no one would listen. Until he got to buying gold mines and fleets of ships. He ruined a lot of people before they believed him insane. He was clever. Insane people are. He could explain everything so ingeniously that he fooled them all."

Dr. Shell preserved a fuming silence.

"Finally, when I caught Sam Wallow with a shotgun," I went on inexorably, "you listened, and people listened. He had been having 'delusions of persecution'; claimed his cousin was causing his downfall. Signs of an unbalanced mind, with a shotgun——"

Dr. Shell grunted and shifted his position until the chair creaked.

"Well," he said grumpily, "while you're up there, look up Twitchett. Twitchett and I were chums during our two academic years. He went on in biology and I went into medicine. Head professor of biology at Chicago now. We correspond—about a letter every five years."

"How kind of you," I said, "after my cruelty to you. I'll be only too glad to have some introductions and some means for making friends there. I don't know a soul."

"Brilliant man, Twitchett," Shell mused. "Genius, even as a freshman. Has published some deuced good stuff already. A year or two ago I heard from him, and he hinted at some astonishing research of his. His hints roused my curiosity. I'll be glad if you can give me some news of what he's driving at, as well as some gossip about him personally. I'll give you a note to him."

THE University of Chicago is a strange and wonderful place. It is a demonstration of how money can make dreams come true. Wise men dreamed of ideals, of a huge university, the greatest seat of learning in the West, of beautiful buildings in which learned minds toiled at unheard-of research. Rockefeller donated the millions. Experienced educators studied and planned. Here it all stands today, just as they first dreamed it. Thousands of busy students swarm here like bees in a hive. It is an institution famous the world over.

"It is a strange and wonderful place," was what I remarked to Dr. Twitchett, when I at last met him and after we had chattered awhile over Shell's letter. His doctorate was a philosophical, not a medical one. He was small, fine-featured, dark; with a suggestion of swiftness in his movements, and a genuine swiftness in his thoughts and conversation. I had met him by telephone appointment in the reading-room of the Faculty Club, under the square tower of Hutchinson Hall.

"Yes," he nodded swiftly. "Here one has opportunities."

I thought of the huge buildings of the Biological Laboratories, and I agreed that there were indeed opportunities for real work. The sight of microscopes through the windows, and of the little courtyard with fountains and pools for growing algae and raising frogs, roused old memories in my mind of a fascinating subject. In my student days I had found biology intensely interesting. I had always meant to learn more about it, to study living forms again; but I had never had time.

"There are some remarkable minds at work in this institution," he went on after a pause. He spoke in short sentences and his tiny black mustache bobbed as he talked.

He seemed to be glad to make my acquaintance, and I, on my side, appreciated the opportunity to make a personal friend in that strange and distant place. Nowhere can one be more lonely than among thousands of strangers. Besides, he had a fascinating personality. I saw him several times at the Faculty Club, lunched at the Commons with him, and once met him for a stroll in the park.

"I've got to show you what I'm working on, one of these days," he remarked, gazing out over the Lake. "I'm putting all my efforts on it, and it's taking all of my time."

He fell silent. Some hidden thought must have sidetracked his intention of talking further about it. In spite of my intense curiosity as to what this strange and brilliant man was doing for the glory of this magnificent institution, I forbore asking him directly. It did not seem that I had known him long enough to be entitled to pry impertinently into his affairs. Therefore, a long time passed before I really found out what it was, to which he was devoting his life.

Several days later we were in the Faculty Club reading-room, and he must have thought of the subject again. Without any introduction, as though we had been talking about it all along, he suddenly said:

"Laymen would not understand it. It isn't suitable material for a popular account. You are a physician. It does not strictly belong in the field of medicine, but nevertheless you will grasp more or less of its significance."

I waited till he should speak further of his research,

his particular function at the University. He, however, mused on:

"I wish I were a physician. It is a vast field for research; much work to be done. My baby died of hydrocephalus. My cousin has epilepsy. I wish I could be a physician."

Suddenly I learned of the line which his research had taken. It was amazing enough. We were walking down the Midway Plaisance on a hot Sunday afternoon, speaking little. Our walk was not rhythmic, and annoyed me; his step was too short and quick for me. I was thinking of his special subject, biology. During this hot summer season, psychology classes were dry and boring. Biology would be much more attractive, it seems so cool and pleasant for biology students to be fishing up green things out of a shady pool and looking at them in a

There on one of them was Twitchett, with an ugly eight foot hydra reaching out at him.

microscope. I hadn't seen protozoa swimming on a slide for many years, and the recollection of these old things threw a pleasant glamour over them.

"You work with living things?" I said rhetorically.

His eyes lighted up with sudden interest.

"I work with them," he answered breathlessly. "I control their life. I direct their growth. In my laboratory I have some strange creatures. You've never seen their like."

I do not know by what accident the wall of reticence that had previously guarded his speech was now broken down. He talked eagerly, rapidly; his swift gestures, his blazing eyes, the rapidity with which his tongue ricocheted over the polysyllabic names, lent a fiery, dramatic quality to the amazing things he told me.

"You know *paramoecium, hydra, vorticella*——?" he asked.

I nodded. They were familiar laboratory forms, and readily found in Nature. I had seen any numbers of them through my own microscope.

"Tiny, one-celled organisms," he jerked out. "So minute that even through a powerful microscope, they appear as mere specks?"

I nodded again.

"Fair representatives of the microscopic world?" he inquired eagerly.

"What's that?" I didn't know what he meant by that.

"I mean," he explained, "if I were selecting examples of the minute world, invisible to the naked eye, these would make a fair choice?"

I nodded in assent.

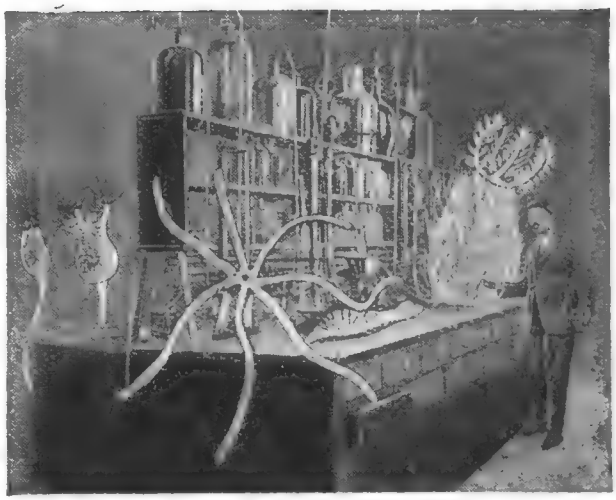
"I've got 'em big. Huge! A *paramoecium* as big as a dog! Can you imagine it at all? Other protozoa just as large. Hundreds of thousands of times increased in size. Just think for a moment how relatively tiny I must seem among them!"

A *paramoecium* as big as a dog! So this was his research, that for several years had been occupying all his time and energy, and making a thin, nervous man out of him! Normally a *paramoecium* is not at all visible to the naked eye; and here I had to picture it as huge and visible; a great, gelatinous mass, which one could carry in one's arms; and in it a nucleus, and over it, cilia. The reader who is not accustomed to seeing these things under a microscope cannot grasp the difficulty I had in imagining this creature large enough to be visible.

"But how—how did you get them to grow that big?"

"Oh," he said nonchalantly, "chiefly by stimulation with endocrines and selective reproduction."

He did not seem to be very willing to talk about that part of it. Distinctly he gave the impression that he was holding the essential portion of it back. I attributed it to his unwillingness to divulge the details of his work until they were formally published. However, I was just a little nettled because he was not willing to trust



The other picture was of a laboratory with huge protozoa scattered about and Twitchett standing among them.

me with the knowledge. I certainly would be the last man to steal it from him.

A few days later I passed him on the campus. I could not conceal my interest in his work and in his personality.

"You'd like to see them?" he asked, as though the conversation had never been interrupted. He seemed very much gratified in my interest in himself and his research. "They are in my laboratory. As soon as I can arrange it so that it is safe—it is necessary to safeguard visitors from these animals—then I shall show them to you."

"You don't mean——?"

"Oh, yes. They are dangerous. One blow from the poisonous tentacle of the hydra—— But I know how to handle them. And the things grow bigger and bigger every day. Some day they're going to get me."

"They can't be that dangerous."

"Well. Consider. The hydra is taller than I am, with tentacles six feet long. You know how it acts. When it notices its prey, it shoots out a poisoned whip from a trichocyst on the tentacle and knocks the victim unconscious, whereupon the tentacles drag the prey into its mouth. I am among them constantly. All day their huge, slimy forms tower about me. Can you imagine how insignificant it would make you feel? Those microscopic forms looming around you all day long! Day and night in fact. The tentacles reach out after me. They would like to seize me and drag me into that mouth. Yes, I know they are after me and I'm careful."

It seemed indeed as though he lived in fear of the creatures his own hand had fashioned. I could not get it off my mind. That night I dreamed of slimy hydrae, as tall as a man. It was hideous. Our talk must have been on his mind also, for the next day he brought two photographs to show me. I gasped at them.

I peered at them closely; I turned them about; I examined them at an angle. Obviously, they were photographs. The glossy surface and the smooth and minute blended rendering of detail could be produced by no other process than photography. There on one of them was Twitchett, with an ugly, eight-foot hydra reaching out at him, with a couple of vorticellae in the background; the scene was laid in the botanical garden. The other picture was of a laboratory, with huge protozoa scattered about, and Twitchett standing among them. If I had any doubt about the hugeness of the protozoa, here were the proofs.

"Made with one of the Eastman self-timers," he explained. "Simple matter: you set the camera and the timer, and then step into the picture; in a few seconds the camera snaps itself."

His readiness to explain this detail confirmed my suspicion of the previous day that he was unwilling to explain his method for growing the huge protozoa, because he wished to keep it secret from me.

"I'm sorry that I can't take you in there and show you the things," he apologized. "My own life may pay for it some day; but I don't want to be responsible for any accident to someone else. See, how small I look. Just imagine what a microscopic creature I am beside those ugly beasts. See how that hydra would like to seize me. And see how many of them I have in the laboratory. All my days belong to these creatures."

For a long time I stared at the photographs without comment. I did not know what to say. Had I seen the photograph of a ghost, I could not have been more amazed. These forms, that I had seen so frequently in the microscope, that, enlarged 500 times looked as large as the head of a pin, here on the photograph looked so large that beside them the man looked tiny. And still I could not picture to myself how they could possibly look in actuality, those gelatinous masses as huge as the photographs showed them.

"Nothing is impossible to science," I finally said breathlessly.

"I don't know what it may not cost me—perhaps my life," he said thoughtfully.

"Would you think I had a lot of nerve," I asked rather hesitantly, "if I asked you to give me one of these pictures?"

A bright light leaped into his eyes. My interest in his work gratified him beyond measure. Such is the humility of a scientific man. He gave me both of the photographs, and I am attaching them to this written account of the case.

"Suppose," he suggested, "that these creatures escaped? Suppose they got out of my laboratory and multiplied over the face of the earth? They multiply with unbelievable rapidity. A creature such as this would eat men as a frog eats flies. Do you see what a responsibility I carry? I am in constant fear lest these things get away from me."

He sighed.

"When do you plan on publishing this? In which journal will it appear?" I asked eagerly.

"I don't know," he mused, in deep thought. "I really don't know. Would it be believed? I wonder?"

That seemed queer to me.

"Haven't you the photographs?" I urged. "And you've published enough first-class stuff to have a good reputation already."

He did not answer, but appeared to be pondering it deeply.

The evening after this meeting, I spent a couple of hours gazing at the pictures he gave me. I saw him a time or two after that, and then an entire week passed without Professor Twitchett's having shown himself in the reading-room of the Faculty Club. As I rarely met him anywhere else, I did not see him during this entire time.

Finally, I grew impatient, or worried, I don't know which, and went over to the Biological Laboratories. He was not in the building. I went through one laboratory after another and found no trace of him.

"I saw him day before yesterday," his assistant said, with a worried look on his face. "This morning we had to dismiss his third-year lecture class because he didn't show up; and this afternoon I am planning on conducting the elementary laboratory section myself. Are you a friend of his—do you know him very well?"

"I know him well enough to be considerably concerned about him," I replied. "Where is his private office—his private laboratory?"

The assistant led me upstairs. He waved his arm into a room.

"This has bothered me a lot lately," he told me.

It was the most disorderly office I have ever seen. How anyone could make head or tail out of those dusty stacks of books, journals, papers, and specimen jars, was a mystery to me. It had a vague suggestion about it that there must be something wrong with the man who belonged there.

"What about this private research of his, these gigantic protozoa?" I asked.

The assistant shook his head.

"He has mentioned it," he said. "But my job is purely a teaching position. I do not get time for research. But he *has* been rather queer lately."

I told the assistant all I knew about it. He gazed at me, his face paralyzed into amazement.

"Now where is this private laboratory of his?" I concluded.

He motioned to a door at the farther end. I got up and seized the knob. It was locked. I shook it till the glass rattled in the bookcases. But it was a firm, heavy door.

"We've got to get in there!" I exclaimed, looking about for something to smash down the door with. "The wonder is that he lasted as long as he did!"

"You think they got him?" he gasped. He was a young man.

"You've seen *amoebae* engulf blood corpuscles?" I reminded him.

He nodded. I seized a chair. He took hold of my arm.

"Wait!" he urged. "The curator has duplicate keys."

He dashed out in search of the curator. For fifteen minutes I paced back and forth, listened with my ear to the door, sniffed at the keyhole, but not a hint of anything penetrated to me; fifteen minutes that seemed like a century. I walked out into the hall, and looked up and down; then I went back in and grabbed the chair and swung it tentatively at the door, but checked myself and waited. Then the assistant hurried in with the curator, a whiskered, breathless, astonished man.

"I have no key to this door," he protested. "Dr. Twitchett wanted it to be strictly private. No one is admitted. I have no duplicate key."

An assistant professor came in, attracted by the commotion, a couple of laboratory assistants, and some students. The story got to them in rapid whispers. The group stood astonished, puzzled, restless.

"We've got to get in there!" I said determinedly, through my gritted teeth. Silent heads nodded in assent.

I swung my chair, but the pieces of it clattered to the floor and the door held. Another chair was wasted in a vain repetition of the attempt. Chair rungs littered the floor. Two students came in carrying a paint-spattered ladder between them. Books and journals were unceremoniously raked aside to clear a way for the battering ram.

"Crash! crash!" the ladder swung against the door, in the hands of a half dozen people. A crack showed in the door; in another moment half of it crashed to the floor far in the other room, and half of it swung around on the hinges. The crowd poured into the room.

It was a laboratory, with a queer, musty smell. But a quick glance showed that it was empty of living things. Long tables, shelves of glassware, preserved specimens everywhere; but not a sign of Professor Twitchett. Not a sign of huge protozoa. As a matter of fact, the dust on everything, the stuffy, musty smell, indicated the suggestion that the room had not been used nor occupied for a long time. I hastened out of there sheepishly, and many queer looks were directed at me.

"But Dr. Twitchett is missing," I reminded them. They dispersed, talking among themselves. I walked toward my room, very much puzzled. Outdoors, walking down the street, I could not get the idea out of my mind that the huge things had eaten Twitchett and then escaped to wreck havoc outside. I wished I could be sure that the queer, musty, organic odor was a natural thing in such a laboratory.

When I reached my room I found on the table a letter addressed to me in Professor Twitchett's handwriting. I tore it open hurriedly.

"Dear Dr. Kane," it read: "As you have evinced a very kind interest in my work, I feel that you might also care to be present at a demonstration of some of my ideas, which will be given before a group of distinguished scientific men. Come then, Tuesday at ten, to the dark brick building on the corner of Polk and Wood streets. Twitchett."

I breathed a sigh of relief. Polk and Wood streets were a long distance from here. I searched for the place on a map of Chicago; it was on the West Side in a section where one can find the greatest concentration of hospitals and medical colleges in the space of a square mile in the whole world. I had thought that Professor Twitchett was doing his work here on the South Side, on the campus of the University.

"Well, anyway," I thought, "at least the world will now hear of this remarkable thing."

I found the corner of Polk and Wood streets and the dark brick building. How I dread to go on with the account of this melancholy case! A sad blow awaited me in that building. It was the southeast corner of the Cook County Hospital grounds, and bore the sign "Detention Hospital." I asked an attendant at the door where I could find Dr. Twitchett. He swelled up pompously and jerked his thumb toward a double door at the end of the corridor. There another guard barred my way; when I showed him the letter from Dr. Twitchett, he stared blankly at me for a while, thought it over, and then opened the door and let me through.

Within I found a group of men about a table littered with papers. Among them I recognized Dr. Kuh, the eminent psychiatrist, under whom I had already done some studying. Nowhere any gigantic protozoa. Professor Twitchett, energetic, fiery, sat in a chair some six feet from the table, with a dull-looking man on each side of him.

I don't know how soon or in what way the truth dawned on me that this was a commitment hearing. My heart sank as soon as I stepped in, and kept on sinking during the entire time. Papers rustled, grave men pursed their lips, and a group of students in a tiny amphitheater stared. Not until Dr. Kuh made his little talk to his students, was I thoroughly clear as to the status of affairs. Dr. Twitchett was adjudged insane and committed to the care of the Psychopathic Hospital.

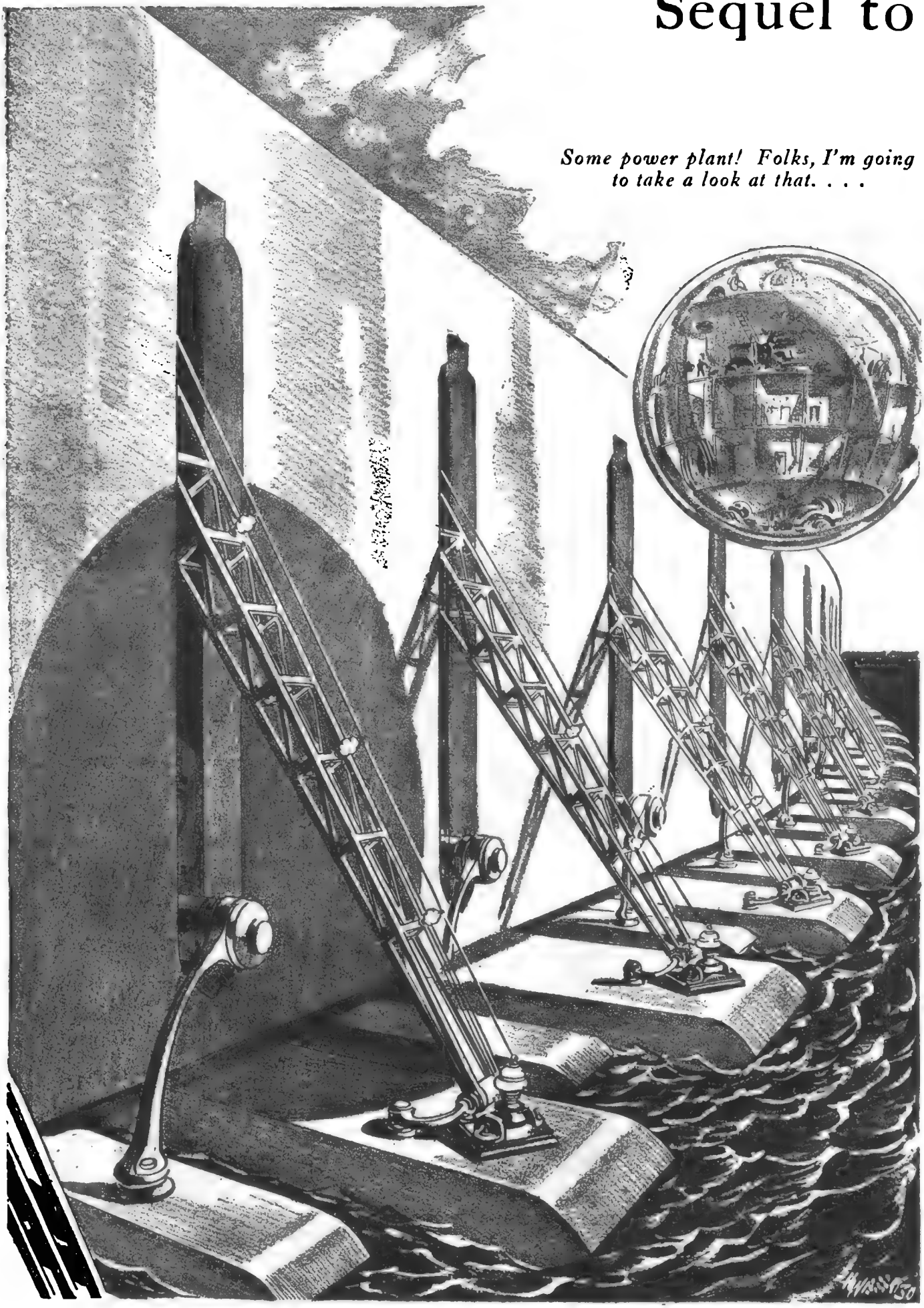
"This is not an uncommon type of case," Dr. Kuh said to his students. "Micromania, a condition in which the patient believes himself to be very small in size, is quite as common a condition as the more popularly known variety in which the patient thinks he is Napoleon Bonaparte.

"But this case is unusual because of the form assumed by the patient's attempts at explaining his *fixed idea* to himself. The mechanism of explanation is also well known in psychiatry. The patient cannot rid himself of his *fixed idea;* therefore he proceeds to build up a structure of other ideas to support it, and to make it appear plausible and reasonable. The ingenuity of the structure of ideas constructed to bolster up the false idea has no limits and is often astonishing. It depends on the native cleverness and intelligence of the patient. I confess that this particular variation has never before come under my observation.

"This patient is obsessed with the idea that he is microscopically small. Thus far he is no different from many of the other cases I have shown you. But, to justify himself in his own eyes and before those who knew him, who would never have believed the claim of his microscopic size, he evolved the idea that he had around him huge protozoa; he could not shake off the idea that he was a microscopic being, therefore he built up a world of microscopic beings around himself. That gave the proper reasonableness to his micromania, and at the same time compensated for his self-deprecation;

(*Continued on page* 566)

Sequel to



Some power plant! Folks, I'm going to take a look at that. . . .

"The Skylark of Space"

Skylark Three

A Serial in Three Parts

Part II

By Edward E. Smith, Ph. D.

WHAT WENT BEFORE

DUQUESNE, a villainous member of Steel Corporation, and a scientist, is bent on obtaining the secret of metal "X," a discovery of Richard Seaton's, another scientist, who has thus far successfully retained the secret. DuQuesne leaves on an extended trip, on an apparently secret mission.

Richard Seaton knows of DuQuesne's nefarious desire for this metal X, and he safeguards himself in some measure by keeping the needle of an object-compass devised to keep tabs on any one person within a radius of tremendous length—the needle pointing at the distant person. For a while, however, he seems to have gone beyond the power of this instrument.

Dunark, of the Green Planet of Osnome, visits the earth, with Sitar, and tells of a fight to a finish with the Kondalian nation, and asks for salt, which is rare in Osnome, in exchange for X, which is plentiful.

After considerable discussion, Seaton, Martin Crane, his partner, and their respective wives start back with Dunark and Sitar, each in his own space ship, after SKYLARK THREE is completed and fitted out with its crew and cook.

On this trip, Seaton and Crane take with them an entirely new weapon, which they call the "rone of force," an impenetrable ray, devastating to the body at which it is directed. They get an opportunity to test it out—successfully—when they meet the ship of the Fenachrone, a vanguard from another universe, preparing for the entire annihilation of the Green Planets. Seaton gets the plans of the Fenachrone, then goes back to have a conference with the Osnomian and Kondalian chiefs and gets them to join with him to battle against the Fenachrone, as they are inimical to numerous nations—in fact every planet they could conquer.

Now we go back to follow DuQuesne in the next instalment of the story—DuQuesne and his partner.

DuQuesne's Voyage

CHAPTER VII

FAR from our solar system a cigar-shaped space-car slackened its terrific acceleration to a point at which human beings could walk, and two men got up, exercised vigorously to restore the circulation to their numbed bodies, and went into the galley to prepare their meal—the first since leaving the Earth some eight hours or more before.

Because of the long and arduous journey he had decided upon, DuQuesne had had to abandon his custom of working alone, and had studied all the available men with great care before selecting his companion and relief pilot. He finally had chosen "Baby Doll" Loring—so called because of his curly yellow hair, his pink and white complexion, his guileless blue eyes, his slight form of rather less than medium height. But never did outward attributes more belie the inner man! The yellow curls covered a brain agile, keen, and hard; the girlish complexion neither paled nor reddened under stress; the wide blue eyes had glanced along the barrels of so many lethal weapons, that in various localities the noose yawned for him; the slender body was built of rawhide and whalebone, and responded instantly to the dictates of that ruthless brain. Under the protection of Steel he flourished, and in return for that protection he performed, quietly and with neatness and despatch, such odd jobs as were in his line, with which he was commissioned.

NOW that Dr. Smith is well started on his trip into intergalactic space, there seems no reason why he should not continue his travels in an exciting manner. Well, he does. In the second instalment of this super-scientific story the author of "The Skylark of Space" proves conclusively that he has learned a great deal, for he has apparently been exploring in the interim before launching on this second thrilling trip, so full of dangerous adventure and new findings on other planets and in other universes. There is unmistakable evidence throughout the story that Dr. Smith is a scientist with an excellent imagination and that he does not fall a bit behind as a writer of tales of rare interest.

When they were seated at an excellent breakfast of ham and eggs, buttered toast, and strong, aromatic coffee, DuQuesne broke the long silence.

"Do you want to know where we are?"

"I'd say we were a long way from home, by the way this elevator of yours has been climbing all night."

"We are a good many million miles from the Earth, and we are getting farther away at a rate that would have to be measured in millions of miles per second." Du-

Quesne, watching the other narrowly as he made this startling announcement and remembering the effect of a similar one upon Perkins, saw with approval that the coffee-cup in midair did not pause or waver in its course. Loring noted the bouquet of his beverage and took an appreciative sip before he replied.

"You certainly can make coffee, Doctor; and good coffee is nine-tenths of a good breakfast. As to where we are—that's all right with me. I can stand it if you can."

"Don't you want to know where we're going, and why?"

"I've been thinking about that. Before we started I didn't want to know anything, because what a man doesn't know he can't be accused of spilling in case of a leak. Now that we are on our way, though, maybe I should know enough about things to act intelligently, if something unforeseen should develop. If you'd rather keep it dark and give me orders when necessary, that's all right with me, too. It's your party, you know."

"I brought you along because one man can't stay on duty twenty-four hours a day, continuously. Since you are in as deep as you can get, and since this trip is dangerous, you should know everything there is to know. You are one of the higher-ups now, anyway: and we understand each other thoroughly, I believe?"

"I believe so."

Back in the bow control-room DuQuesne applied more power, but not enough to render movement impossible.

"You don't have to drive her as hard all the way, then, as you did last night?"

"No, I'm out of range of Seaton's instrument now, and we don't have to kill ourselves. High acceleration is punishment for anyone and we must keep ourselves fit. To begin with, I suppose that you are curious about that object-compass?"

"That and other things."

"An object-compass is a needle of specially-treated copper, so activated that it points always toward one certain object, after being once set upon it. Seaton undoubtedly has one upon me; but, sensitive as they are, they can't hold on a mass as small as a man at this distance. That was why we left at midnight, after he had gone to bed—so that we'd be out of range before he woke up. I wanted to lose him, as he might interfere if he knew where I was going. Now I'll go back to the beginning and tell you the whole story."

TERSELY, but vividly, he recounted the tale of the interstellar cruise, the voyage of the *Skylark of Space*. When he had finished, Loring smoked for a few minutes in silence.

"There's a lot of stuff there that's hard to understand all at once. Do you mind if I ask a few foolish questions, to get things straightened out in my mind?"

"Go ahead—ask as many as you want to. It is hard to understand a lot of that Osnomian stuff—a man can't get it all at once."

"Osnome is so far away—how are you going to find it?"

"With one of the object-compasses I mentioned. I had planned on navigating from notes I took on the trip back to the Earth, but it wasn't necessary. They tried to keep me from finding out anything, but I learned all about the compasses, built a few of them in their own shop, and set one on Osnome. I had it, among other things, in my pocket when I landed. In fact, the control of that explosive copper bullet is the only thing they had that I wasn't able to get—and I'll get that on this trip."

"What is that arenak armor they're wearing?"

"Arenak is a synthetic metal, almost perfectly transparent. It has practically the same refractive index as air, therefore it is, to all intents and purposes, invisible. It's about five hundred times as strong as chrome-vanadium steel, and even when you've got it to the yield-point, it doesn't break, but stretches out and snaps back, like rubber, with the strength unimpaired. It's the most wonderful thing I saw on the whole trip. They make complete suits of it. Of course they aren't very comfortable, but since they are only a tenth of an inch they can be worn."

"And a tenth of an inch of that stuff will stop a steel nosed machine-gun bullet?"

"Stop it! A tenth of an inch of arenak is harder to pierce than fifty inches of our hardest, toughest armor steel. A sixteenth-inch armor-piercing projectile couldn't get through it. It's hard to believe, but nevertheless it's a fact. The only way to kill Seaton with a gun would be to use one heavy enough so that the shock of the impact would kill him—and it wouldn't surprise me a bit if he had his armor anchored with an attractor against that very contingency. Even if he hasn't, you can imagine the chance of getting action against him with a gun of that size."

"Yes, I've heard that he is fast."

"That doesn't tell half of it. You know that I'm handy with a gun myself?"

"You're faster than I am, and that's saying something. You're chain lightning."

"Well, Seaton is at least that much faster than I am. You've never seen him work—I have. On that Osnomian dock he shot twice before I started, and shot twice to my once from then on. I must have been shooting a quarter of a second after he had his side all cleaned up. To make it worse I missed once with my left hand—he didn't. There's absolutely no use tackling Richard Seaton without an Osnomian ray-generator or something better; but, as you know, Brookings always has been and always will be a fool. He won't believe anything new until after he has actually been shown. Well, I imagine he will be shown plenty by this evening."

"Well, I'll never tackle him with heat. How does he get that way?"

"He's naturally fast, and has practiced sleight-of-hand work ever since he was a kid. He's one of the best amateur magicians in the country, and I will say that his ability along that line has come in handy for him more than once."

"I see where you're right in wanting to get something, since we have only ordinary weapons and they have all that stuff. This trip is to get a little something for ourselves, I take it?"

"Exactly, and you know enough now to understand what we are out here to get for ourselves. You have guessed that we are headed for Osnome?"

"I suspected it. However, if you were going only to Osnome, you would have gone alone; so I also suspect that that's only half of it. I have no idea what it is, but you've got something else on your mind."

"You're right—I knew you were keen. When I was on Osnome I found out something that only four other men—all—dead—ever knew. There is a race of men far ahead of the Osnomians in science, particularly in

warfare. They live a long way beyond Osnome. It is my plan to steal an Osnomian airship and mount all its ray screens, generators, guns, and everything else, upon this ship, or else convert their vessel into a space-ship. Instead of using their ordinary power, however, we will do as Seaton did, and use intra-atomic power, which is practically infinite. Then we'll have everything Seaton's got, but that isn't enough. I want enough more than he's got to wipe him out. Therefore, after we get a ship armed to suit us, we'll visit this strange planet and either come to terms with them or else steal a ship from them. Then we'll have their stuff and that of the Osnomians, as well as our own. Seaton won't last long after that."

"Do you mind if I ask how you got that dope?"

"Not at all. Except when right with Seaton I could do pretty much as I pleased, and I used to take long walks for exercise. The Osnomians tired very easily, being so weak, and because of the light gravity of the planet, I had to do a lot of work or walking to keep in any kind of condition at all. I learned Kondalian quickly, and got so friendly with the guards, that pretty soon they quit trying to keep me in sight, but waited at the edge of the palace grounds until I came back and joined them.

"Well, on one trip I was fifteen miles or so from the city when an airship crashed down in a woods about half a mile from me. It was in an uninhabited district and nobody else saw it. I went over to investigate, thinking probably I could find out something useful. It had the whole front end cut or broken off, and that made me curious, because no imaginable fall will break an arenak hull. I walked in through the hole and saw that it was one of their fighting tenders—a combination warship and repair shop, with all of the stuff in it that I've been telling you about. The generators were mostly burned out and the propelling and lifting motors were out of commission. I prowled around, getting acquainted with it, and found a lot of useful instruments and, best of all, one of Dunark's new mechanical educators, with complete instructions for its use. Also, I found three bodies, and thought I'd try it out. . . ."

"Just a minute. Only three bodies on a warship? And what good could a mechanical educator do you if the men were all dead?"

"Three is all I found then, but there was another one. Three men and a captain compose an Osnomian crew for any ordinary vessel. Everything is automatic, you know. As for the men being dead, that doesn't make any difference—you can read their brains just the same, if they haven't been dead too long. However, when I tried to read theirs, I found only blanks—their brains had been destroyed so that nobody could read them. That did look funny, so I ransacked the ship from truck to keelson, and finally found another body, wearing an air-helmet, in a sort of closet off the control room. I put the educator on it. . . ."

"This is getting good. It sounds like a page of the old 'Arabian Nights' that I used to read when I was a boy. You know, it really isn't surprising that Brookings didn't believe a lot of this stuff."

"As I've said, a lot of it is hard to understand, but I'm going to show it to you—all that, and more."

"Oh, I believe it, all right. After riding in this boat and looking out of the windows, I'll believe anything. Reading a dead man's brain is steep, though."

"I'll let you do it after we get there. I don't understand exactly how it works, myself, but I know how to operate one. Well, I found out that this man's brain was in good shape, and I got a shock when I read it. Here's what he had been through. They had been flying very high on their way to the front when their ship was seized by an invisible force and thrown upward. He must have thought faster than the others, because he put on an air-helmet and dived into this locker where he hid under a pile of gear, fixing things so that he could see out through the transparent arenak of the wall. No sooner was he hidden than the front end of the ship went up in a blaze of light, in spite of their ray screens going full blast. They were up so high by that time that when the bow was burned off the other three fainted from lack of air. Then their generators went out, and pretty soon two peculiar-looking strangers entered. They were wearing vacuum suits and were very short and stocky, giving the impression of enormous strength. They brought an educator of their own with them and read the brains of the three men. Then they dropped the ship a few thousand feet and revived the three with a drink of something out of a flask."

"Must have been different from the kind handled by most booties I know, then. The stuff we've been getting lately would make a man more unconscious than ever."

"Some powerful drug, probably, but the Osnomian didn't know anything about it. After the men were revived, the strangers, apparently from sheer cruelty and love of torturing their victims, informed them in the Osnomian language that they were from another world, on the far edge of the Galaxy. They even told them, knowing that the Osnomians knew nothing of astronomy, exactly where they were from. Then they went on to say that they wanted the entire green system for themselves, and that in something like two years of our time they were going to wipe out all the present inhabitants of the system and take it over, as a base for further operations. After that they amused themselves by describing exactly the kinds of death and destruction they were going to use. They described most of it in great detail. It's too involved to tell you about now, but they've got rays, generators, and screens that even the Osnomians never heard of. And of course they've got intra-atomic energy, the same as we have. After telling them all this and watching them suffer, they put a machine up to their heads and they dropped dead. That's probably what disintegrated their brains. Then they looked the ship over rather casually, as though they didn't see anything they were interested in; crippled the motors; and went away. The vessel was then released, and crashed. This man, of course, was killed by the fall. I buried the men—I didn't want anybody else reading that brain—hid some of the stuff I wanted most, and camouflaged the ship so that I'm fairly sure that it's there yet. I decided then to make this trip."

"I see." Loring's mind was grappling with these new and strange facts. "That news is staggering, Doctor. Think of it. Everybody thinks our own world is everything there is!"

"Our world is simply a grain of dust in the Universe. Most people know it, academically, but very few ever give the fact any actual consideration. But now that you've had a little time to get used to the idea of there being other worlds, and some of them as far ahead of us in science as we are ahead of the monkeys, what do you think of it?"

"I agree with you, that we've got their stuff," said Loring. "However, it occurs to me as a possibility that

they may have so much stuff that we won't be able to make the approach. However, if the Osnomian fittings we're going to get are as good as you say they are, I think that two such men as you and I can get at least a lunch while any other crew, no matter who they are, are getting a square meal."

"I like your style, Loring. You and I will have the world eating out of our hands shortly after we get back. As far as actual procedure over there is concerned, of course, I haven't made any definite plans. We'll have to size up the situation after we get there before we can know exactly what we'll have to do. However, we are not coming back empty-handed."

"You said something, Chief!" and the two men, so startlingly unlike physically, but so alike inwardly, shook hands in token of their mutual dedication to a single purpose.

LORING was then instructed in the simple navigation of the ship of space, and thereafter the two men took their regular shifts at the controls. In due time they approached Osnome, and DuQuesne studied the planet carefully through a telescope before he ventured down into the atmosphere.

"This half of it used to be Mardonale. I suppose it's all Kondal now. No, there's a war on down there yet—at least, there's a disturbance of some kind, and on this planet that means war."

"What are you looking for, exactly?" asked Loring, who was also examining the terrain with a telescope.

"They've got some spherical space-ships, like Seaton's. I know they had one, and they've probably built more of them since that time. Their airships can't touch us, but those ball-shaped cruisers would be pure poison for us, the way we are fixed now. Can you see any of them?"

"Not yet. Too far away to make out details. They're certainly having a hot time down there, though, in that one spot."

They dropped lower, toward the stronghold which was being so stubbornly defended by the inhabitants of the third planet of the fourteenth sun, and so savagely attacked by the Kondalian forces.

"There, we can see what they're doing now," and DuQuesne anchored the vessel with an attractor. "I want to see if they've got many of those space-ships in action, and you will want to see what war is like, when it is fought by people, who have been making war steadily for ten thousand years."

Poised at the limit of clear visibility, the two men studied the incessant battle being waged beneath them. They saw not one, but fully a thousand of the globular craft high in the air and grouped in a great circle around an immense fortification upon the ground below. They saw no airships in the line of battle, but noticed that many such vessels were flying to and from the front, apparently carrying supplies. The fortress was an immense dome of some glassy, transparent material, partially covered with slag, through which they saw that the central space was occupied by orderly groups of barracks, and that round the circumference were arranged gigantic generators, projectors, and other machinery at whose purposes they could not even guess. From the base of the dome a twenty-mile-wide apron of the same glassy substance spread over the ground, and above this apron and around the dome were thrown the mighty defensive ray-screens, visible now and then in scintillating violet splendor as one of the copper-driven Kondalian projectors sought in vain for an opening. But the Earthmen saw with surprise that the main attack was not being directed at the dome; that only an occasional ray was thrown against it in order to make the defenders keep their screens up continuously. The edge of the apron was bearing the brunt of that vicious and never-ceasing attack, and most concerned the desperate defense.

For miles beyond that edge, and as deep under it as frightful rays and enormous charges of explosive copper could penetrate, the ground was one seething, flaming volcano of molten and incandescent lava; lava constantly being volatilized by the unimaginable heat of those rays and being hurled for miles in all directions by the inconceivable power of those explosive copper projectiles—the heaviest projectiles that could be used without endangering the planet itself—being directed under the exposed edge of that unbreakable apron, which was in actuality anchored to the solid core of the planet itself; lava flowing into and filling up the vast craters caused by the explosions. The attack seemed fiercest at certain points, perhaps a quarter of a mile apart around the circle, and after a time the watchers perceived that at those points, under the edge of the apron, in that indescribable inferno of boiling lava, destructive rays, and disintegrating copper, there were enemy machines at work. These machines were strengthening the protecting apron and extending it, very slowly, but ever wider and ever deeper as the ground under it and before it was volatilized or hurled away by the awful forces of the Kondalian attack. So much destruction had already been wrought that the edge of the apron and its molten moat were already fully a mile below the normal level of that cratered, torn, and tortured plain.

Now and then one of the mechanical moles would cease its labors, overcome by the concentrated fury of destruction centered upon it. Its shattered remnants would be withdrawn and shortly, repaired or replaced, it would be back at work. But it was not the defenders who had suffered most heavily. The fortress was literally ringed about with the shattered remnants of airships, and the riddled hulls of more than a few of those mighty globular cruisers of the void bore mute testimony to the deadliness and efficiency of the warfare of the invaders.

Even as they watched, one of the spheres, unable for some reason to maintain its screens or overcome by the awful forces playing upon it, flared from white into and through the violet and was hurled upward as though shot from the mouth of some Brobdingnagian howitzer. A door opened, and from its flaming interior four figures leaped out into the air, followed by a puff of orange-colored smoke. At the first sign of trouble, the ship next it in line leaped in front of it and the four figures floated gently to the ground, supported by friendly attractors and protected from enemy rays by the bulk and by the screens of the rescuing vessel. Two great airships soared upward from back of the lines and hauled the disabled vessel to the ground by means of their powerful attractors. The two observers saw with amazement that after brief attention from an ant-like ground-crew, the original four men climbed back into their warship and she again shot into the fray, apparently as good as ever.

"What do you know about that!" exclaimed DuQuesne. "That gives me an idea, Loring. They must get to them that way fairly often, to judge by the teamwork they use when it does happen. How about waiting until they disable another one like that, and then grabbing

it while it is in the air, deserted and unable to fight back? One of those ships is worth a thousand of this one, even if we had everything known to the Osnomians."

"That's a real idea—those boats certainly are brutes for punishment," agreed Loring, and as both men again settled down to watch the battle, he went on: "So this is war out this way? You're right. Seaton, with half this stuff, could whip the combined armies and navies of the world. I don't blame Brookings much, though, at that—nobody could believe half of this unless they could actually see it, as we are doing."

"I can't understand it," DuQuesne frowned as he considered the situation. The attackers are Kondalians, all right—those ships are developments of the *Skylark*—but I don't get that fort at all. Wonder if it can be the strangers already?" Don't think so—they aren't due for a couple of years yet, and I don't think the Kondalians could stand against them a minute. It must be what is left of Mardonale, although I never heard of anything like that. Probably it is some new invention they dug up at the last minute. "That's it, I guess," and his brow cleared. "It couldn't be anything else."

THEY waited long for the incident to be repeated, and finally their patience was rewarded. When the next vessel was disabled and hurled upward by the concentration of enemy forces, DuQuesne darted down, seized it with his most powerful attractor, and whisked it away into space at such a velocity that to the eyes of the Kondalians it simply disappeared. He took the disabled warship far out into space and allowed it to cool off for a long time before deciding that it was safe to board it. Through the transparent walls they could see no sign of life, and DuQuesne donned a vacuum suit and stepped into the airlock. As Loring held the steel vessel close to the stranger, DuQuesne leaped lightly through the open door into the interior. Shutting the door, he opened an auxiliary air-tank, adjusting the gauge to one atmosphere as he did so. The pressure normal, he divested himself of the suit and made a thorough examination of the vessel. He then signalled Loring to follow him, and soon both ships were over Kondal, so high as to be invisible from the ground. Plunging the vessel like a bullet toward the grove in which he had left the Kondalian airship, he slowed abruptly just in time to make a safe landing. As he stepped out upon Osnomian soil, Loring landed the Earthly ship hardly less skillfully.

"This saves us a lot of trouble, Loring. This is undoubtedly one of the finest space-ships of the Universe, and just about ready for anything."

"How did they get to it?"

"One of the screen generators apparently weakened a trifle, probably from weeks of continuous use. That let some of the rays come through; everything got hot, and the crew had to jump or roast. Nothing is hurt, though, as the ship was thrown up and out of range before the arenak melted at all. The copper repellers are gone, of course, and most of the bars that were in use are melted down, but there was enough of the main bar left to drive the ship and we can replace the melted stuff easily enough. Nothing else was hurt, as there's absolutely nothing in the structure of these vessels that can be burned. Even the insulation in the coils and generators has a melting-point higher than that of porcelain. And not all the copper was melted, either. Some of these storerooms are lined with two feet of insulation and are piled full of bars and explosive ammunition."

"What was the smoke we saw, then?"

"That was their food-supply. It's cooked to an ash, and their water was all boiled away through the safety-valves. Those rays certainly can put out a lot of heat in a second or two!"

"Can the two of us put on those copper repeller-bands? This ship must be seventy-five feet in diameter."

"Yes, it's a lot bigger than the *Skylark* was. It's one of their latest models, or it wouldn't have been on the front line. As to banding on the repellers—that's easy. That airship is half full of metal-working machinery that can do everything but talk. I know how to use most of it, from seeing it in use, and we can figure out the rest."

In that unfrequented spot there was little danger of detection from the air, and none whatever of detection from the ground—of ground-travel upon Osnome there is none. Nevertheless, the two men camouflaged the vessels so that they were visible only to keen and direct scrutiny, and drove their task through to completion in the shortest possible time. The copper repellers were banded on, and much additional machinery was installed in the already well-equipped shop. This done, they transferred to their warship food, water, bedding, instruments, and everything else they needed or wanted from their own ship and from the disabled Kondalian airship. They made a last tour of inspection to be sure they had overlooked nothing useful, then embarked.

"Think anybody will find those ships? They could get a good line on what we've done."

"Probably, eventually, Loring, so we'd better destroy them. We'd better take a short hop first, though, to test everything out. Since you're not familiar with the controls of a ship of this type, you need practise. Shoot us up around that moon over there and bring us back to this spot."

"She's a sweet-handling boat—easy like a bicycle," declared Loring as he brought the vessel lightly to a landing upon their return. "We can burn the old one up now. We'll never need her again, any more than a snake needs his last year's skin."

"She's good, all right. Those two hulks must be put out of existence, but we shouldn't do it here. The rays would set the woods afire, and the metal would condense all around. We don't want to leave any tracks, so we'd better pull them out into space to destroy them. We could turn them loose, and as you've never worked a ray, it'll be good practice for you. Also, I want you to see for yourself just what our best armor-plate amounts to compared with arenak."

When they had towed the two vessels far out into space Loring put into practise the instruction he had received from DuQuesne concerning the complex armament of their vessel. He swung the beam-projector upon the Kondalian airship, pressed the connectors of the softener ray, the heat ray, and the induction ray, and threw in the master switch. Almost instantly the entire hull became blinding white, but it was several seconds before the extremely refractory material began to volatilize. Though the metal was less than an inch thick, it retained its shape and strength stubbornly, and only slowly did it disappear in flaming, flaring gusts of incandescent gas.

"There, you've seen what an inch of arenak is like," said DuQuesne when the destruction was complete. "Now shine it on that sixty-inch chrome-vanadium armor hull of our old bus and see what happens."

Loring did so. As the beam touched it, the steel disappeared in one flare of radiance—as he swung the pro-

jector in one flashing arc from the stem to the stern there was nothing left. Loring, swinging the beam, whistled in amazement.

"Wow! What a difference! And this ship of ours has a skin of arenak six feet thick!"

"Yes. Now you understand why I didn't want to argue with anybody out here as long as we were in our steel ship."

"I understand, all right; but I can't understand the power of these rays. Suppose I had had all twenty of them on instead of only three?"

"In that case, I think that we could have whipped even the short, thick strangers."

"You and me both. But say, every ship's got to have a name. This new one of ours is such a sweet, harmless, inoffensive little thing, we'd better name her the *Violet,* hadn't we?"

DUQUESNE started the *Violet* off in the direction of the solar system occupied by the warlike strangers, but he did not hurry. He and Loring practiced incessantly for days at the controls, darting here and there, putting on terrific acceleration until the indicators showed a velocity of hundreds of thousand of miles per second, then reversing the acceleration until the velocity was zero. They studied the controls and alarm system until each knew perfectly every instrument, every tiny light, and the tone of each bell. They practiced with the rays, singly and in combination, with the visiplates, and with the many levers and dials, until each was so familiar with the complex installation that his handling of every control had become automatic. Not until then did DuQuesne give the word to start out in earnest toward their goal, at an unthinkable distance.

They had not been under way long when an alarm bell sounded its warning and a brilliant green light began flashing upon the board.

"Hm . . m," DuQuesne frowned as he reversed the bar. "Outside intra-atomic energy detector. Somebody's using power out here. Direction, about dead ahead—straight down. Let's see if we can see anything."

He swung number six, the telescopic visiplate, into connection. After what seemed to them a long time they saw a sudden sharp flash, apparently an immense distance ahead, and simultaneously three more alarm bells rang and three colored lights flashed briefly.

"Somebody got quite a jolt then. Three rays in action at once for three or four seconds," reported DuQuesne, as he applied still more negative acceleration.

"I'd like to know what this is all about!" he exclaimed after a time, as they saw a subdued glow, which lasted a minute or two. As the warning light was flashing more and more slowly and with diminishing intensity, the *Violet* was once more put upon her course. As she proceeded, however, the warnings of the liberation of intra-atomic energy grew stronger and stronger, and both men scanned their path intensely for a sight of the source of the disturbance, while their velocity was cut to only a few hundred miles an hour. Suddenly the indicator swerved and pointed behind them, showing that they had passed the object, whatever it was. DuQuesne instantly applied power and snapped on a small searchlight.

"If it's so small that we couldn't see it when we passed it, it's nothing to be afraid of. We'll be able to find it with a light."

After some search, they saw an object floating in space—apparently a vacuum suit!

"Shall one of us get in the airlock, or shall we bring it in with an attractor?" asked Loring.

"An attractor, by all means. Two or three of them, in fact, to spread-eagle whatever it is. Never take any chances. It's probably an Osnomian, but you never can tell. It may be one of those other people. We know they were around here a few weeks ago, and they're the only ones I know of that have intra-atomic power besides us and the Osnomians."

"That's no Osnomian," he continued, as the stranger was drawn into the airlock. "He's big enough around for four Osnomians, and very short. We'll take no chances at all with that fellow."

The captive was brought into the control room, pinioned head, hand, and foot with attractors and repellers, before DuQuesne approached him. He then read the temperature and pressure of the stranger's air-supply, and allowed the surplus air to escape slowly before removing the stranger's suit and revealing one of the Fenachrone—eyes closed, unconscious or dead.

DuQuesne leaped for the educator and handed Loring a headset.

"Put this on quick. He may be only unconscious, and we might not be able to get a thing from him if he were awake."

Loring donned the headset, still staring at the monstrous form with amazement, not unmixed with awe, while DuQuesne, paying no attention to anything except the knowledge he was seeking, manipulated the controls of the instrument. His first quest was for the weapons and armament of the vessel. In this he was disappointed, as he learned that the stranger was one of the navigating engineers, and as such, had no detailed knowledge of the matters of prime importance to the inquisitor. He did have a complete knowledge of the marvelous Fenachrone propulsion system, however, and this DuQuesne carefully transferred to his own brain. He then rapidly explored other regions of that fearsome organ of thought.

As the gigantic and inhuman brain was spread before them, DuQuesne and Loring read not only the language, customs, and culture of the Fenachrone, but all their plans for the future, as well as the events of the past. Plainly in his mind they perceived how he had been cast adrift in the emptiness of the void. They saw the Fenachrone cruiser lying in wait for the two globular vessels. Looking through an extraordinarily powerful telescope with the eyes of their prisoner, they saw them approach, all unsuspecting. DuQuesne recognized all five persons in the *Skylark* and Dunark and Sitar in the *Kondal;* such was that unearthly optical instrument and so clear was the impression upon the mind before him. They saw the attack and the battle. They saw the *Skylark* throw off her zone of force and attack; saw this one survivor standing directly in line with a huge projector-spring, and saw the spring severed by the zone. The free end, under its thousands of pounds of tension, had struck the being upon the side of the head, and the force of the blow, only partially blocked by the heavy helmet, had hurled him out through the yawning gap in the wall and hundreds of miles out into space.

Suddenly the clear view of the brain of the Fenachrone became blurred and meaningless and the flow of knowledge ceased—the prisoner had regained consciousness and was trying with all his gigantic strength to break from those intangible bonds that held him. So powerful were the forces upon him, however, that only a few

twitching muscles gave evidence that he was struggling at all. Glancing about him he recognized the attractors and repellers bearing upon him, ceased his efforts to escape, and hurled the full power of his baleful gaze into the black eyes so close to his own. But DuQuesne's mind, always under perfect control and now amply reenforced by a considerable proportion of the stranger's own knowledge and power, did not waver under the force of even that hypnotic glare.

"It is useless, as you observe," he said coldly, in the stranger's own tongue, and sneered. "You are perfectly helpless. Unlike you of the Fenachrone, however, men of my race do not always kill strangers at sight, merely because they are strangers. I will spare your life, if you can give me anything of enough value to me to make the extra time and trouble worth while."

"You read my mind while I could not resist your childish efforts. I will have no traffic whatever with you who have destroyed my vessel. If you have mentality enough to understand any portion of my mind—which I doubt—you already know the fate in store for you. Do with me what you will." This from the stranger.

DUQUESNE pondered long before he replied; considering whether it was to his advantage to inform this stranger of the facts. Finally he decided.

"Sir, neither I nor this vessel had anything to do with the destruction of your warship. Our detectors discovered you floating in empty space; we stopped and rescued you from death. We have seen nothing else, save what we saw pictured in your own brain. I know that, in common with all of your race, you possess neither concience nor honor, as we understand the terms. An automatic liar by instinct and training whenever you think lies will best serve your purpose, you may yet have intelligence enough to recognize simple truth when you hear it. You already have observed that we are of the same race as those who destroyed your vessel, and have assumed that we are with them. In that you are wrong. It is true that I am acquainted with those others, but they are my enemies. I am here to kill them, not to aid them. You have already helped me in one way—I know as much as does my enemy concerning the impenetrable shield of force. If I will return you unharmed to your own planet, will you assist me in stealing one of your ships of space, so that I may destroy that Earth-vessel?"

The Fenachrone, paying no attention to DuQuesne's barbed comments concerning his honor and veracity, did not hesitate an instant in his reply.

"I will not. We supermen of the Fenachrone will allow no vessel of ours, with its secrets unknown to any others of the Universe, to fall into the hands of any of the lesser breeds of man."

"Well, you didn't try to lie that time, anyway," said DuQuesne, "but think a minute. Seaton, my enemy, already has one of your vessels—don't think he is too much of a fool to put it back together and to learn its every secret. Then, too, remember that I have your mind, and can get along without you; even though I am willing to admit that you could be of enough help to me so that I would save your life in exchange for that help. Also remember that, superman though you may be, your mentality cannot cope with the forces I have bearing upon you. Neither will your being a superman enable your body to retain life after I have pushed you through yonder door, dressed as you are in a silken tunic."

"I have the normal love of life," was the reply, "but some things cannot be done, even with life at stake. Stealing a vessel of the Fenachrone is one of those things. I can, however, do this much—if you will return me to my own planet, you two shall be received as guests aboard one of our vessels and shall be allowed to witness the vengeance of the Fenachrone upon your enemy. Then you shall be returned to your vessel and allowed to depart unharmed."

"Now you are lying by rote—I know just what you'd do," said DuQuesne. "Get that idea out of your head right now. The attractors now holding you will not be released until after you have told all. Then, and then only, will we try to discover a way of returning you to your own world safely, and yet in a manner which will in no way jeopardize my own safety. Incidentally, I warn you that the first sign of an attempt to play false with me in any way will mean your instant death."

The prisoner remained silent, analyzing every feature of the situation, and DuQuesne continued, coldly:

"Here's something else for you to think about. If you are unwilling to help us, what is to prevent me from killing you, and then hunting up Seaton and making peace with him for the duration of this forthcoming war? With the fragments of your vessel, which he has; with my knowledge of your mind, reenforced by your own dead brain; and with the vast resources of all the planets of the green system; there is no doubt that the plans of the Fenachrone will be seriously interfered with. Myriads of your race will certainly lose their lives, and it is quite possible that your entire race would be destroyed. Understand that I care nothing for the green system. You are welcome to it if you do as I ask. If you do not, I shall warn them and help them simply to protect my own world, which is now my own personal property."

"In return for our armament and equipment, you promise not to warn the green system against us? The death of your enemy takes first place in your mind?" The stranger spoke thoughtfully. "In that I understand your viewpoint thoroughly. But, after I have remodeled your power-plant into ours and have piloted you to our planet, what assurance have I that you will liberate me, as you have said?"

"None whatever—I have made and am asking no promises, since I cannot expect you to trust me, any more than I can trust you. Enough of this argument! I am master here, and I am dictating terms. We can get along without you. Therefore you must decide quickly whether you would rather die suddenly and surely, here in space and right now, or help us as I demand and live until you get back home—enjoying meanwhile your life and whatever chance you think you may have of being liberated within the atmosphere of your own planet."

"Just a minute, Chief!" Loring said, in English, his back to the prisoner. "Wouldn't we gain more by killing him and going back to Seaton and the green system, as you suggested?"

"No." DuQuesne also turned away, to shield his features from the mind-reading gaze of the Fenachrone. "That was pure bluff. I don't want to get within a million miles of Seaton until after we have the armament of this fellow's ships. I couldn't make peace with Seaton now, even if I wanted to—and I haven't the slightest intention of trying. I intend killing him on sight. Here's what we're going to do. First, we'll get what we came after. Then we'll find the *Skylark* and blow her clear

out of space, and take over the pieces of that Fenachrone ship. After that we'll head for the green system, and with their own stuff and what we'll give them, they'll be able to give those fiends a hot reception. By the time they finally destroy the Osnomians—if they do—we'll have the world ready for them." He turned to the Fenachrone. "What is your decision?"

"I submit, in the hope that you will keep your promise, since there is no alternative but death," and the awful creature, still loosely held by the attractors and carefully watched by DuQuesne and Loring, fairly tore into the task of rebuilding the Osnomian power-plant into the space-annihilating drive of the Fenachrone—for he well knew one fact that DuQuesne's hurried inspection had failed to glean from the labyrinthine intricacies of that fearsome brain: that once within the detector screens of that distant solar system these Earth-beings would be utterly helpless before the forces which would inevitably be turned upon them. Also, he realized that time was precious, and resolved to drive the *Violet* so unmercifully that she would overtake that fleeing torpedo, now many hours upon its way—the torpedo bearing news, for the first time in Fenachrone history, of the overwhelming defeat and capture of one of its mighty engines of interstellar war.

In a very short time, considering the complexity of the undertaking, the conversion of the power-plant was done and the repellers, already supposed the ultimate in protection, were reenforced by a ten-thousand-pound mass of activated copper, effective for untold millions of miles. Their monstrous pilot then set the bar and advanced both levers of the dual power control out to the extreme limit of their travel.

There was no sense of motion or of acceleration, since the new system of propulsion acted upon every molecule of matter within the radius of activity of the bar, which had been set to include the entire hull. The passengers felt only the utter lack of all weight and the other peculiar sensations with which they were already familiar, as each had had previous experience of free motion in space. But in spite of the lack of apparent motion, the *Violet* was now leaping through the unfathomable depths of interstellar space with the unthinkable speed of five times the velocity of light!

CHAPTER VIII

The Porpoise-Men of Dasor

"HOW long do you figure it's going to take us to get there, Mart?" Seaton asked from a corner, where he was bending over his apparatus-table.

"About three days at this acceleration. I set it at what I thought the safe maximum for the girls. Should we increase it?"

"Probably not—three days isn't bad. Anyway, to save even one day we'd have to more than double the acceleration, and none of us could do anything, so we'd better let it ride. How're you making it, Peg?"

"I'm getting used to weighing a ton now. My knees buckled only once this morning from my forgetting to watch them when I tried to walk. Don't let me interfere, though! if I am slowing us down, I'll go to bed and stay there!"

"It'd hardly pay," said Seaton. "We can use the time to good advantage. Look here, Mart—I've been looking over this stuff I got out of their ship, and here's something I know you'll eat up. They refer to it as a chart, but it's three-dimensional and almost incredible. I can't say that I understand it, but I get an awful kick out of looking at it. I've been studying it a couple of hours, and haven't started yet. I haven't found our solar system, the green one, or their own. It's too heavy to move around now, because of the acceleration we're using—come on over here and give it a look."

The "chart" was a strip of some parchment-like material, or film, apparently miles in length, wound upon reels at each end of the machine. One section of the film was always under the viewing mechanism—an optical system projecting an undistorted image into a visiplate somewhat similar to their own—and at the touch of a lever, a small atomic motor turned the reels and moved the film through the projector.

It was not an ordinary star-chart: it was three-dimensional, ultra-stereoscopic. The eye did not perceive a flat surface, but beheld an actual, extremely narrow wedge of space as seen from the center of the galaxy. Each of the closer stars was seen in its true position in space and in its true perspective, and each was clearly identified by number. In the background were faint stars and nebulous masses of light, too distant to be resolved into separate stars—a true representation of the actual sky. As both men stared, fascinated, into the visiplate, Seaton touched the lever and they apparently traveled directly along the center line of that ever-widening wedge. As they proceeded, the nearer stars grew brighter and larger, soon becoming suns, with their planets and then the satellites of the planets plainly visible, and finally passing out of the picture behind the observers. The fainter stars became bright, grew into suns and solar systems, and were passed in turn. The chart unrolled, and the nebulous masses of light were approached, became composed of faint stars, which developed as had the others, and were passed.

Finally, when the picture filled the entire visiplate, they arrived at the outermost edge of the galaxy. No more stars were visible: they saw empty space stretching for inconceivably vast distances before them. But beyond that indescribable and incomprehensible vacuum they saw faint lenticular bodies of light, which were also named, and which each man knew to be other galaxies, charted and named by the almost unlimited power of the Fenachrone astronomers, but not as yet explored. As the magic scroll unrolled still farther, they found themselves back in the center of the galaxy, starting outward in the wedge adjacent to the one which they had just traversed. Seaton cut off the motor and wiped his forehead.

"Wouldn't that break you off at the ankles, Mart? Did you ever conceive the possibility of such a thing?"

"It would, and I did not. There are literally miles and miles of film in each of those reels, and I see that there is a magazine full of reels in the cabinet. There must be an index or a master-chart."

"Yeah, there's a book in this slot here," said Seaton, "but we don't know any of their names or numbers—wait a minute! How did he report our Earth on that torpedo? Planet number three of sun six four something Pilarone, wasn't it? I'll get the record."

"Six four seven three Pilarone, it was."

"Pilarone . . . let's see . . ." Seaton studied the index volume. "Reel twenty, scene fifty-one, I'd translate it."

They found the reel, and "scene fifty-one" did indeed

show that section of space in which our solar system is. Seaton stopped the chart when star six four seven three was at its closest range, and there was our sun; with its nine planets and their many satellites accurately shown and correctly described.

"They know their stuff, all right—you've got to hand it to 'em. I've been straightening out that brain record—cutting out the hazy stretches and getting his knowledge straightened out so we can use it, and there's a lot of this kind of stuff in the record you can get. Suppose that you can figure out exactly where he comes from with this dope and with his brain record?"

"Certainly. I may be able to get more complete information upon the green system than the Osnomians have, which will be very useful indeed. You are right—I am intensely interested in this material, and if you do not care particularly about studying it any more at this time, I believe that I should begin to study it now."

"Hop to it. I'm going to study that record some more. No human brain can take it all, I'm afraid, especially all at once, but I'm going to kinda peck around the edges and get me some dope that I want pretty badly. We got a lot of stuff from that wampus."

About sixty hours out, Dorothy, who had been observing the planet through number six visiplate, called Seaton away from the Fenachrone brain-record, upon which he was still concentrating.

"Come here a minute, Dickie! Haven't you got that knowledge all packed away in your skull yet?"

"I'll say I haven't. That bird's brain would make a dozen of mine, and it was loaded until the scuppers were awash. I'm just nibbling around the edges yet."

"I've always heard that the capacity of even the human brain was almost infinite. Isn't that true?" asked Margaret.

"Maybe it is, if the knowledge were built up gradually over generations. I think maybe I can get most of this stuff into my peanut brain so I can use it, but it's going to be an awful job."

"Is their brain really as far ahead of ours as I gathered from what I saw of it?" asked Crane.

"It sure is," replied Seaton, "as far as knowledge and intelligence are concerned, but they have nothing else in common with us. They don't belong to the genus 'homo' at all, really. Instead of having a common ancestor with the anthropoids, as they say we had, they evolved from a genus which combined the worst traits of the cat tribe and the carnivorous lizards—the two most savage and bloodthirsty branches of the animal kingdom—and instead of getting better as they went along, they got worse, in that respect at least. But they sure do know something. When you get a month or so to spare, you want to put on this harness and grab his knowledge, being very careful to steer clear of his mental traits and so on. Then, when we get back to the Earth, we'll simply tear it apart and rebuild it. You'll know what I mean when you get this stuff transplanted into your own skull. But to cut out the lecture, what's on your mind, Dottie Dimple?"

"This planet Martin picked out is all wet, literally. The visibility is fine—very few clouds—but this whole half of it is solid ocean. If there are any islands, even, they're mighty small."

ALL four looked into the receiver. With the great magnification employed, the planet almost filled the visiplate. There were a few fleecy wisps of cloud, but the entire surface upon which they gazed was one sheet of the now familiar deep and glorious blue peculiar to the waters of that cuprous solar system, with no markings whatever.

"What d'you make of it, Mart? That's water, all right—copper-sulphate solution, just like the Osnomian and Urvanian oceans—and nothing else visible. How big would an island have to be for us to see it from here?"

"So much depends upon the contour and nature of the island, that it is hard to say. If it were low and heavily covered with their green-blue vegetation, we might not be able to see even a rather large one, whereas if it were hilly and bare, we could probably see one only a few miles in diameter."

"Well, one good thing, anyway, we're approaching it from the central sun, and almost in line with their own sun, so it's daylight all over it. As it turns and as we get closer, we'll see what we can see. Better take turns watching it, hadn't we?" asked Seaton.

It was decided, and while the *Skylark* was still some distance away, several small islands became visible, and the period of rotation of the planet was determined to be in the neighborhood of fifty hours. Margaret, then at the controls, picked out the largest island visible and directed the bar toward it. As they dropped down close to their objective, they found that the air was of the same composition as that of Osnome, but had a pressure of seventy-eight centimeters of mercury, and that the surface gravity of the planet was ninety-five hundredths that of the Earth.

"Fine business!" exulted Seaton. "Just about like home, but I don't see much of any place to land without getting wet, do you? Those reflectors are probably solar generators, and they cover the whole island except for that lagoon right under us."

The island, perhaps ten miles long and half that in width, was entirely covered with great parabolic reflectors, arranged so closely together that little could be seen between them. Each reflector apparently focussed upon an object in the center, a helix which seemed to writhe luridly in that flaming focus, glowing with a nacreous, opalescent green light.

"Well, nothing much to see there—let's go down," remarked Seaton as he shot the *Skylark* over to the edge of the island and down to the surface of the water. But here again nothing was to be seen of the land itself. The wall was one vertical plate of seamless metal, supporting huge metal guides, between which floated metal pontoons. From these gigantic floats metal girders and trusses went through slots in the wall into the darkness of the interior. Close scrutiny revealed that the large floats were rising steadily, although very slowly; while smaller floats bobbed up and down upon each passing wave.

"Solar generators, tide-motors, and wave-motors, all at once!" ejaculated Seaton. "*Some* power-plant! Folks, I'm going to take a look at that if I have to drill in with a ray!"

They circumnavigated the island without revealing any door or other opening—the entire thirty miles was one stupendous battery of the generators. Back at the starting point, the *Skylark* hopped over the structure and down to the surface of the small central lagoon previously noticed. Close to the water, it was seen that there was plenty of room for the vessel to move about beneath the roof of reflectors, and that the island was

one solid stand of tide-motors. At one end of the lagoon was an open metal structure, the only building visible, and Seaton brought the space-cruiser up to it and through the huge opening—for door there was none. The interior of the room was lighted by long, tubular, lights running around in front of the walls, which were veritable switchboards. Row after row and tier upon tier stood the instruments, plainly electrical meters of enormous capacity and equally plainly in full operation, but no wiring or bus-bar could be seen. Before each row of instruments there was a narrow walk, with steps leading down into the water of the lagoon. Every part of the great room was plainly visible, and not a living being was even watching that vast instrument-board.

"What do you make of it, Dick?" asked Crane, slowly.

"No wiring—tight beam transmission. The Fenachrone do it with two matched-frequency separable units. Millions and millions of kilowatts there, if I'm any judge. Absolutely automatic too, or else——" Seaton's voice died away.

"Or else what?" asked Dorothy.

"Just a hunch. I wouldn't wonder if——"

"Hold it, Dicky! Remember I had to put you to bed after that last hunch you had!"

"Here it is, anyway. Mart, what would be the logical line of evolution when the planet has become so old that all the land has been eroded to a level below that of the ocean? You picked us out an old one, all right—so old that there's no land left. Would a highly civilized people revert to fish? That seems like a backward move to me, but what other answer is possible?"

"Probably not to true fishes—although they might easily develop some fish-like traits. I do not believe, however, that they would go back to gills or to cold blood."

"What *are* you two saying?" interrupted Margaret. "Do you mean to say that you think *fish* live here instead of people, and that *fish* did all this?" as she waved her hand at the complicated machinery about them.

"Not fish exactly, no." Crane paused in thought. "Merely a people who have adjusted themselves to their environment through conscious or natural selection. We had a talk about this very thing in our first trip, shortly after I met you. Remember? I commented on the fact that there must be life throughout the Universe, much of it that we could not understand; and you replied that there would be no reason to suppose them awful because incomprehensible. That may be the case here."

"Well, I'm going to find out," declared Seaton, as he appeared with a box full of coils, tubes, and other apparatus.

"How?" asked Dorothy, curiously.

"Fix me up a detector and follow up one of those beams. Find its frequency and direction, first, you know, then pick it up outside and follow it to where it's going. It'll go through anything, of course, but I can trap off enough of it to follow it, even if it's tight enough to choke itself," said Seaton.

"That's one thing I got from that brain record."

HE worked deftly and rapidly, and soon was rewarded by a flaring crimson color in his detector when it was located in one certain position in front of one of the meters. Noting the bearing on the great circles, he then moved the *Skylark* along that exact line, over the reflectors, and out beyond the island, where he allowed the vessel to settle directly downwards.

"Now folks, if I've done this just right, we'll get a red flash directly."

As he spoke the detector again burst into crimson light, and he set the bar into the line and applied a little power, keeping the light at its reddest while the other three looked on in fascinated interest.

"This beam is on something that's moving, Mart—can't take my eyes off it for a second or I'll lose it entirely. See where we're going, will you?"

"We are about to strike the water," replied Crane quietly.

"The water!" exclaimed Margaret.

"Fair enough—why not?"

"Oh, that's right—I forgot that the *Skylark* is as good a submarine as she is an airship."

Crane pointed number six visiplate directly into the line of flight and started into the dark water.

"How deep are we, Mart?" asked Seaton after a time.

"Only about a hundred feet, and we do not seem to be getting any deeper."

"That's good. Afraid this beam might be going to a station on the other side of the planet—through the ground. If so, we'd have had to go back and trace another. We can follow it any distance under water, but not through rock. Need a light?"

"Not unless we go deeper."

For two hours Seaton held the detector upon that tight beam of energy, traveling at a hundred miles an hour, the highest speed he could use and still hold the beam.

"I'd like to be up above watching us. I bet we're making the water boil behind us," remarked Dorothy.

"Yeah, we're kicking up quite a wake, I guess. It sure takes power to drive the old can through this wetness."

"Slow down!" commanded Crane. "I see a submarine ahead. I thought it might be a whale at first, but it is a boat and it is what we are aiming for. You are constantly swinging with it, keeping it exactly in the line."

"O. K." Seaton reduced the power and swung the visiplate over in front of him, whereupon the detector lamp went out. "It's a relief to follow something I can see, instead of trying to guess which way that beam's going to wiggle next. Lead on, Macduff—I'm right on your tail!"

The *Skylark* fell in behind the submersible craft, close enough to keep it plainly visible in the telescopic visiplate. Finally the stranger stopped and rose to the surface between two rows of submerged pontoons which, row upon row, extended in every direction as far as the telescope could reach.

"Well, Dot, we're where we're going, wherever that is."

"What do you suppose it is? It looks like a floating isleport, like what it told about in that wild-story magazine you read so much."

"Maybe—but if so they can't be fish." answered Seaton. "Let's go—I want to look it over," and water flew in all directions as the *Skylark* burst out of the ocean and leaped into the air far above what was in truth a floating city.

Rectangular in shape, it appeared to be about six miles long and four wide. It was roofed with solar generators like those covering the island just visited,

but the machines were not spaced quite so closely together, and there were numerous open lagoons. The water around the entire city was covered with wave-motors. From their great height the visitors could see an occasional submarine moving slowly under the city, and frequently small surface craft dashed across the lagoons. As they watched, a seaplane with short, thick wings curved like those of a gull, rose from one of the lagoons and shot away over the water.

"Quite a place," remarked Seaton as he swung a visiplate upon one of the lagoons. "Submarines, speed-boats, and fast seaplanes. Fish or not, they're not so slow. I'm going to grab off one of those folks and see how much they know. Wonder if they're peaceable or warlike?"

"They look peaceable, but you know the proverb," Crane cautioned his impetuous friend.

"Yes, and I'm going to be timid like a mice," Seaton returned as the *Skylark* dropped rapidly toward a lagoon near the edge of the island.

"You ought to put that in a gag book, Dick," Dorothy chuckled. "You forget all about being timid until an hour afterwards."

"Watch me, Red-top! If they even point a finger at us, I'm going to run a million miles a minute."

No hostile demonstration was made as they dropped lower and lower, however, and Seaton, with one hand upon the switch actuating the zone of force, slowly lowered the vessel down past the reflectors and to the surface of the water. Through the visiplate he saw the crowd of people coming toward them—some swimming in the lagoon, some walking along narrow runways. They seemed to be of all sizes, and unarmed.

"I believe they're perfectly peaceable, and just curious, Mart. I've already got the repellers on close range —believe I'll cut them off altogether."

"How about the ray-screens?"

"All three full out. They don't interfere with anything solid, though, and won't hurt anything. They'll stop any ray attack and this arenak hull will stop anything else we are apt to get there. Watch this board, will you, and I'll see if I can't negotiate with them."

Seaton opened the door. As he did so, a number of the smaller beings dived headlong into the water, and a submarine rose quietly to the surface less than fifty feet away with a peculiar tubular weapon and a huge ray-generator trained upon the *Skylark*. Seaton stood motionless, his right hand raised in the universal sign of peace, his left holding at his hip an automatic pistol charged with X-plosive shells—while Crane, at the controls, had the Fenachrone super-generator in line, and his hand lay upon the switch, whose closing would volatilize the submarine and cut an incandescent path of destruction through the city lengthwise.

AFTER a moment of inaction, a hatch opened, a man stepped out upon the deck of the submarine, and the two tried to converse, but with no success. Seaton then brought out the mechanical educator, held it up for the other's inspection, and waved an invitation to come aboard. Instantly the other dived, and came to the surface immediately below Seaton, who assisted him into the *Skylark*. Tall and heavy as Seaton was, the stranger was half a head taller and almost twice as heavy. His thick skin was of the characteristic Osnomian green and his eyes were the usual black, but he had no hair whatever. His shoulders, though broad and enormously strong, were very sloping, and his powerful arms were little more than half as long as would have been expected had they belonged to a human being of his size. The hands and feet were very large and very broad, and the fingers and toes were heavily webbed. His high domed forehead appeared even higher because of the total lack of hair, otherwise his features were regular and well-proportioned. He carried himself easily and gracefully, and yet with the dignity of one accustomed to command as he stepped into the control room and saluted gravely the three other Earth-beings. He glanced quickly around the room, and showed unmistakable pleasure as he saw the power-plant of the cruiser of space. Languages were soon exchanged and the stranger spoke, in a bass voice vastly deeper than Seaton's own.

"In the name of our city and planet—I may say in the name of our solar system, for you are very evidently from one other than our green system—I greet you. I would offer you refreshment, as is our custom, but I fear that your chemistry is but ill adapted to our customary fare. If there be aught in which we can be of assistance to you, our resources are at your disposal —before you leave us, I shall wish to ask from you a great gift."

"Sir, we thank you. We are in search of knowledge concerning forces which we cannot as yet control. From the power systems you employ, and from what I have learned of the composition of your suns and planets, I presume you have none of the metal of power, and it is a quantity of that element that is your greatest need?"

"Yes. Power is our only lack. We generate all we can with the materials and knowledge at our disposal, but we never have enough. Our development is hindered, our birth-rate must be held down to a minimum, many new cities which we need cannot be built and many new projects cannot be started, all for lack of power. For one gram of that metal I see plated upon that copper cylinder, of whose very existence no scientist upon Dasor has had even an inkling, we would do almost anything. In fact, if all else failed, I would be tempted to attack you, did I not know that our utmost power could not penetrate even your outer screen, and that you could volatilize the entire planet if you so desired."

"Great Cat!" In his surprise Seaton lapsed from the formal language he had been employing. "Have you figured us all out already, from a standing start?"

"We know electricity, chemistry, physics, and mathematics fairly well. You see, our race is many millions of years older than is yours."

"You're the man I've been looking for, I guess," said Seaton. "We have enough of this metal with us so that we can spare you some as well as not. But before you get it, I'll introduce you. Folks, this is Sacner Carfon, Chief of the Council of the planet Dasor. They saw us all the time, and when we headed for this, the Sixth City, he came over from the capital, or First City, in the flagship of his police fleet, to welcome us or to fight us, as we pleased. Carfon, this is Martin Crane —or say, better than introductions, put on the headsets, everybody, and get acquainted right."

Acquaintance made and the apparatus put away, Seaton went to one of the store-rooms and brought out a lump of "X," weighing about a hundred pounds.

"There's enough to build power-plants from now on. It would save time if you were to dismiss your submarine. With you to pilot us, we can take you back to the First City a lot faster than your vessel can travel."

Carfon took a miniature transmitter from a pouch under his arm and spoke briefly, then gave Seaton the course. In a few minutes, the First City was reached, and the *Skylark* descended rapidly to the surface of a lagoon at one end of the city. Short as had been the time consumed by their journey from the Sixth City, they found a curious and excited crowd awaiting them. The central portion of the lagoon was almost covered by the small surface craft, while the sides, separated from the sidewalks by the curbs, were full of swimmers. The peculiar Dasorian equivalents of whistles, bells, and gongs were making a deafening uproar, and the crowd was yelling and cheering in much the same fashion as do earthly crowds upon similar occasions. Seaton stopped the *Skylark* and took his wife by the shoulder, swinging her around in front of the visiplate.

"Look at that, Dot. Talk about rapid transit! They could give the New York subway a flying start and beat them hands down!"

DOROTHY looked into the visiplate and gasped. Six metal pipes, one above the other, ran above and parallel to each sidewalk-lane of water. The pipes were full of ocean water, water racing along at fully fifty miles an hour and discharging, each stream a small waterfall, into the lagoon. Each pipe was lighted in the interior, and each was full of people, heads almost touching feet, unconcernedly being borne along, completely immersed in that mad current. As the passenger saw daylight and felt the stream begin to drop, he righted himself, apparently selecting an objective point, and rode the current down into the ocean. A few quick strokes, and he was either at the surface or upon one of the flights of stairs leading up to the platform. Many of the travelers did not even move as they left the orifice. If they happened to be on their backs, they entered the ocean backward and did not bother about righting themselves or about selecting a destination until they were many feet below the surface.

"Good heavens, Dick! They'll kill themselves or drown!"

"Not these birds. Notice their skins? They've got a hide like a walrus, and a terrific layer of subcutaneous fat. Even their heads are protected that way—you could hardly hit one of them enough with a baseball bat to hurt him. And as for drowning—they can outswim a fish, and can stay under water almost an hour without coming up for air. Even one of those youngsters can swim the full length of the city without taking a breath."

"How do you get that velocity of flow, Carfon?" asked Crane.

"By means of pumps. These channels run all over the city, and the amount of water running in each tube and the number of tubes in use are regulated automatically by the amount of traffic. When any section of tube is empty of people, no water flows through it. This was necessary in order to save power. At each intersection there are four stand pipes and automatic swim-counters that regulate the volume of water and the number of tubes in use. This is ordinarily a quiet pool, as it is in a residence section, and this channel—our channels correspond to your streets, you know—has only six tubes each way. If you will look on the other side of the channel, you will see the intake end of the tubes going down-town."

Seaton swung the visiplate around and they saw six rapidly-moving stairways, each crowded with people, leading from the ocean level up to the top of a tall metal tower. As the passengers reached the top of the flight, they were catapulted head-first into the chamber leading to the tube below.

"Well, that is *some* system for handling people!" exclaimed Seaton. "What's the capacity of the system?"

"When running full pressure, six tubes will handle five thousand people a minute. It is only very rarely, on such occasions as this, that they are ever loaded to capacity. Some of the channels in the middle of the city have as many as twenty tubes, so that it is always psssible to go from one end of the city to the other in less than ten minutes."

"Don't they ever jam?" asked Dorothy curiously. "I've been lost more than once in the New York subway, and been in some perfectly frightful jams, too—and they weren't moving ten thousand people a minute either."

"No jams ever have occurred. The tubes are perfectly smooth and well-lighted, and all turns and intersections are rounded. The controlling machines allow only so many persons to enter any tube—if more should try to enter than can be carried comfortably, the surplus passengers are slid off down a chute to the swim-ways, or sidewalks, and may either wait a while or swim to the next intersection."

"That looks like quite a jam down there now." Seaton pointed to the receiving pool, which was now one solid mass except for the space kept clear by the six mighty streams of humanity-laden water.

"If the newcomers can't find room to come to the surface they'll swim over to some other pool." Carfon shrugged indifferently. "My residence is the fifth cubicle on the right side of this channel. Our custom demands that you accept the hospitality of my home, if only for a moment and only for a beaker of distilled water. Any ordinary visitor could be received in my office, but you must enter my home."

Seaton steered the *Skylark* carefully, surrounded as she was by a tightly packed crowd of swimmers, to the indicated dwelling, and anchored her so that one of the doors was close to a flight of steps leading from the corner of the building down into the water. Carfon stepped out, opened the door of his house, and preceded his guests within. The room was large and square, and built of a synthetic, non-corroding metal, as was the entire city. The walls were tastefully decorated with striking geometrical designs in many-colored metal, and upon the floor was a softly woven rug. Three doors leading into other rooms could be seen, and strange pieces of furniture stood here and there. In the center of the floor-space was a circular opening some four feet in diameter, and there, only a few inches below the level of the floor, was the surface of the ocean.

Carfon introduced his guests to his wife—a feminine replica of himself, although she was not of quite such heroic proportions.

"I don't suppose that Seven is far away, is he?" Carfon asked of the woman.

"Probably he is outside, near the flying ball. If he has not been touching it ever since it came down, it is

only because someone stronger than he pushed him aside. You know how boys are," turning to Dorothy with a smile as she spoke, "boy nature is probably universal."

"Pardon my curiosity, but why 'Seven'?" asked Dorothy, as she returned the smile.

"He is the two thousand three hundred and forty-seventh Sacner Carfon in direct male line of descent," she explained. "But perhaps Six has not explained these things to you. Our population must not be allowed to increase, therefore each couple can have only two children. It is customary for the boy to be born first, and is given the name of his father. The girl is younger, and is given her mother's name."

"That will now be changed," said Carfon feelingly. "These visitors have given us the secret of power, and we shall be able to build new cities and populate Dasor as she should be populated."

"Really?——" She checked herself, but a flame leaped to her eyes, and her voice was none too steady as she addressed the visitors. "For that we Dasorians thank you more than words can express. Perhaps you strangers do not know what it means to want a dozen children with every fiber of your being and to be allowed to have only two—we do, all too well—I will call Seven."

She pressed a button, and up out of the opening in the middle of the floor there shot a half-grown boy, swimming so rapidly that he scarcely touched the coaming as he came to his feet. He glanced at the four visitors, then ran up to Seaton and Crane.

"Please, sirs, may I ride, just a little short ride, in your vessel before you go away?" This was said in their language.

"Seven!" boomed Carfon sternly, and the exuberant youth subsided.

"Pardon me, sirs, but I was so excited——"

"All right, son, no harm done at all. You bet you'll have a ride in the *Skylark* if your parents will let you." He turned to Carfon. "I'm not so far beyond that stage myself that I'm not in sympathy with him. Neither are you, unless I'm badly mistaken."

"I am very glad that you feel as you do. He would be delighted to accompany us down to the office, and it will be something to remember all the rest of his life."

"You have a little girl, too?" Dorothy asked the woman.

"Yes—would you like to see her? She is asleep now," and without waiting for an answer, the proud Dasorian mother led the way into a bedroom—a bedroom without beds, for Dasorians sleep floating in thermostatically controlled tanks, buoyed up in water of the temperature they like best, in a fashion that no Earthly springs and mattresses can approach. In a small tank in a corner reposed a baby, apparently about a year old, over whom Dorothy and Margaret made the usual feminine ceremony of delight and approbation.

BACK in the living room, after an animated conversation in which much information was exchanged concerning the two planets and their races of peoples, Carfon drew six metal goblets of distilled water and passed them around. Standing in a circle, the six touched goblets and drank.

They then embarked, and while Crane steered the *Skylark* slowly along the channel toward the offices of the Council, and while Dorothy and Margaret showed the eager Seven all over the vessel, Seaton explained to Carfon the danger that threatened the Universe, what he had done, and what he was attempting to do.

"Doctor Seaton, I wish to apologize to you," the Dasorian said when Seaton had done. "Since you are evidently still land animals, I had supposed you of inferior intelligence. It is true that your younger civilization is deficient in certain respects, but you have shown a depth of vision, a sheer power of imagination and grasp, that no member of our older civilization could approach. I believe that you are right in your conclusions. We have no such rays nor forces upon this planet, and never have had; but the sixth planet of our own sun has. Less than fifty of your years ago, when I was but a small boy, such a projection visited my father. It offered to 'rescue' us from our watery planet, and to show us how to build rocket-ships to move us to Three, which is half land, inhabited by lower animals."

"And he didn't accept?"

"Certainly not. Then as now our sole lack was power, and the strangers did not show us how to increase our supply. Perhaps they had more power than we, perhaps, because of the difficulty of communication, our want was not made clear to them. But, of course, we did not want to move to Three, and we had already had rocket-ships for hundreds of generations. We have never been able to reach Six with them, but we visited Three long ago; and every one who went there came back as soon as he could. We detest land. It is hard, barren, unfriendly. We have everything, here upon Dasor. Food is plentiful, synthetic or natural, as we prefer. Our watery planet supplies our every need and wish, with one exception; and now that we are assured of power, even that one exception vanishes, and Dasor becomes a very Paradise. We can now lead our natural lives, work and play to our fullest capacity—we would not trade our world for all the rest of the Universe."

"I never thought of it in that way, but you're right, at that," Seaton conceded. "You are ideally suited to your environment. But how do I get to planet Six? Its distance is terrific, even as cosmic distances go. You won't have any night until Dasor swings outside the orbit of your sun, and until then Six will be invisible, even to our most powerful telescope."

"I do not know, myself," answered Carfon, "but I will send out a call for the chief astronomer. He will meet us, and give you a chart and the exact course."

At the office, the earthly visitors were welcomed formally by the Council—the nine men in control of the entire planet. The ceremony over and their course carefully plotted, Carfon stood at the door of the *Skylark* a moment before it closed.

"We thank you with all force, Earthmen, for what you have done for us this day. Please remember, and believe that this is no idle word—if we can assist you in any way in this conflict which is to come, the resources of this planet are at your disposal. We join Osnome and the other planets of this system in declaring you, Doctor Seaton, our Overlord."

CHAPTER IX

The Welcome to Norlamin

THE *Skylark* was now days upon her way toward the sixth planet, Seaton gave the visiplates and the instrument board his customary careful scrutiny and rejoined the others.

"Still talking about the human fish, Dottie Dimple?" he asked, as he stoked his villainous pipe. "Peculiar tribe of porpoises, but I'm strong for 'em. They're the most like our own kind of folks, as far as ideas go, of anybody we've seen yet—in fact, they're more like us than a lot of human beings we all know."

"I like them immensely——"

"You couldn't like 'em any other way, their size——"

"Terrible, Dick, terrible! Easy as I am, I can't stand for any such joke as that was going to be. But, really, I think they're just perfectly fine, in spite of their being so funny-looking. Mrs. Carfon is just simply sweet, even if she does look like a walrus, and that cute little seal of a baby was just too perfectly cunning for words. That boy Seven is keen as mustard, too."

"He should be," put in Crane, dryly. "He probably has as much intelligence now as any one of us."

"Do you think so?" asked Margaret. "He acted like any other boy, but he did seem to understand things remarkably well."

"He would—they're 'way ahead of us in most things." Seaton glanced at the two women quizzically and turned to Crane. "And as for their being bald, this was one time, Mart, when those two phenomenal heads of hair our two little girl-friends are so proud of didn't make any kind of a hit at all. They probably regard that black thatch of Peg's and Dot's auburn mop as relics of a barbarous and prehistoric age—about as we would regard the hirsute hide of a Neanderthal man."

"That may be so, too," Dorothy replied, unconcernedly, "but we aren't planning on living there, so why worry about it? I like them, anyway, and I believe that they like us."

"They acted that way. But say, Mart, if that planet is so old that all their land area has been eroded away, how come they've got so much water left? And they've got quite an atmosphere, too."

"The air-pressure," said Crane," while greater than that now obtaining upon Earth, was probably of the order of magnitude of three meters of mercury, originally. As to the erosion, they might have had more water to begin with than our Earth had."

"Yeah, that'd account for it, all right," said Dorothy. "There's one thing I want to ask you two scientists," Margaret said. "Everywhere we've gone, except on that one world that Dick thinks is a wandering planet, we've found the intelligent life quite remarkably like human beings. How do you account for that?"

"There, Mart, is one for the massive old bean to concentrate on," challenged Seaton: then, as Crane considered the question in silence for some time he went on: "I'll answer it myself, then, by asking another. Why not? Why shouldn't they be? Remember, man is the highest form of earthly life—at least, in our own opinion and as far as we know. In our wanderings, we have picked out planets quite similar to our own in point of atmosphere and temperature and, within narrow limits, of mass as well. It stands to reason that under such similarity of conditions, there would be a certain similarity of results. How about it, Mart? Reasonable?"

"It seems plausible, in a way," conceded Crane, "but it probably is not universally true."

"Sure not—couldn't be, hardly. No doubt we could find a lot of worlds inhabited by all kinds of intelligent things—freaks that we can't even begin to imagine now—but they probably would be occupying planets entirely different from ours in some essential feature of atmosphere, temperature, or mass."

"But the Fenachrone world is entirely different," Dorothy argued, "and they're more or less human—they're bipeds, anyway, with recognizable features. I've been studying that record with you, you know, and their world has so much more mass than ours that their gravitation is simply frightful!"

"That much difference is comparatively slight, not a real fundamental difference. I meant a hundred or so times either way—greater or less. And even their gravitation has modified their structure a lot—suppose it had been fifty times as great as it is? What would they have been like? Also, their atmosphere is very similar to ours in composition, and their temperature is bearable. It is my opinion that atmosphere and temperature have more to do with evolution than anything else, and that the mass of the planet runs a poor third."

"You may be right," admitted Crane, "but it seems to me that you are arguing from insufficient premises."

"Sure I am—almost no premises at all. I would be just about as well justified in deducing the structure of a range of mountains from a superficial study of three pebbles picked up in a creek near them. However, we can get an idea some time, when we have a lot of time."

"How?"

"Remember that planet we struck on the first trip, that had an atmosphere composed mostly of gaseous chlorin? In our ignorance we assumed that life there was impossible, and didn't stop. Well, it may be just as well that we didn't. If we go back there, protected as we are with our rays and stuff, it wouldn't surprise me a bit to find life there, and lots of it—and I've got a hunch that it'll be a form of life that'd make your grandfather's whiskers curl right up into a ball!"

"You do get the weirdest ideas, Dick!" protested Dorothy. "I hope you aren't planning on exploring it, just to prove your point?"

"Never thought of it before. Can't do it now, anyway—got our hands full already. However, after we get this Fenachrone mess cleaned up we'll have to do just that little thing, won't we, Mart? As that intellectual guy said while he was insisting upon dematerializing us, 'Science demands it.'"

"By all means. We should be in a position to make contributions to science in fields as yet untouched. Most assuredly we shall investigate those points."

"Then they'll go alone, won't they, Peggy?"

"Absolutely! We've seen some pretty middling horrible things already, and if these two men of ours call the frightful things we have seen normal, and are planning on deliberately hunting up things that even they will consider monstrous, you and I most certainly shall stay at home!"

"Yeah? You say it easy. Bounce back, Peg, you've struck a rubber fence! Rufus, you red-headed little fraud, you know you wouldn't let me go to the corner store after a can of tobacco without insisting on tagging along!"

"You're a . . . " began Dorothy hotly, but broke off in amazement and gasped, "For Heaven's sake, what was that?"

"What was what? It missed me."

"It went right through you! It was a kind of funny little cloud, like smoke or something. It came right

through the ceiling like a flash—went right through you and on down through the floor. There it comes back again!"

BEFORE their staring eyes a vague, nebulous something moved rapidly upward through the floor and passed upward through the ceiling. Dorothy leaped to Seaton's side and he put his arm around her reassuringly.

"'Sall right, folks—I know what that thing is."

"Well, shoot it, quick!" Dorothy implored.

"It's one of those projections from where we're heading for, trying to get our range; and it's the most welcome sight these weary old eyes have rested upon for full many a long and dreary moon. They've probably located us from our power-plant rays. We're an awful long ways off yet, though, and going like a streak of greased lightning, so they're having trouble in holding us. They're friendly, we already know that—they probably want to talk to us. It'd make it easier for them if we'd shut off our power and drift at constant velocity, but that'd use up valuable time and throw our calculations all out of whack. We'll let them try to match our acceleration. If they can do that, they're good."

The apparition reappeared, oscillating back and forth irregularly—passing through the arenak walls, through the furniture and the instrument boards, and even through the mighty power-plant itself, as though nothing was there. Eventually, however, it remained stationary a foot or so above the floor of the control-room. Then it began to increase in density until apparently a man stood before them. His skin, like that of all the inhabitants of the planets of the green suns, was green. He was tall and well-proportioned when judged by Earthly standards, except for his head, which was overly large, and which was particularly massive above the eyes and backward from the ears. He was evidently of great age, for what little of his face was visible was seamed and wrinkled, and his long, thick mane of hair and his square-cut, yard-long beard were a dazzling white, only faintly tinged with green.

While not in any sense transparent, nor even translucent, it was evident that the apparition before them was not composed of flesh and blood. He looked at each of the four Earth-beings intensely for a moment, then pointed toward the table upon which stood the mechanical educator, and Seaton placed it in front of the peculiar visitor. As Seaton donned a headset and handed one to the stranger, the latter stared at him, impressing upon his consciousness that he was to be given a knowledge of English. Seaton pressed the lever, receiving as he did so a sensation of an unbroken calm, a serenity profound and untroubled, and the projection spoke.

"Dr. Seaton, Mr. Crane, and ladies—welcome to Norlamin, the planet toward which you are now flying. We have been awaiting you for more than five thousand years of your time. It has been a mathematical certainty—it has been graven upon the very Sphere itself—that in time someone would come to us from without this system, bringing a portion, however small, of Rovolon—of the metal of power, of which there is not even the most minute trace in our entire solar system. For more than five thousand years our instruments have been set to detect the vibrations which would herald the advent of the user of that metal. Now you have come, and I perceive that you have vast stores of it. Being yourselves seekers after truth, you will share it with us gladly as we will instruct you in many things you wish to know. Allow me to operate the educator—I would gaze into your minds and reveal my own to your sight. But first I must tell you that your machine is too rudimentary to work at all well, and with your permission I shall make certain minor alterations."

Seaton nodded permission, and from the eyes and from the hands of the figure there leaped visible streams of force, which seized the transformers, coils, and tubes, and reformed and reconnected them, under Seaton's bulging eyes, into an entirely different mechanism.

"Oh, I see!" he gasped. "Say, what are you, anyway?"

"Pardon me; in my eagerness I became forgetful. I am Orlon, the First of Astronomy of Norlamin, in my observatory upon the surface of the planet. This that you see is simply my projection, composed of forces for which you have no name in your language. You can cut it off, if you wish, with your ray-screens, which even I can see are of a surprisingly high order of efficiency. There, this educator will now work very well. Please put on the remodeled headsets, all four of you."

They did so, and the rays of force moved levers, switches, and dials as positively as human hands could have moved them, and with infinitely greater speed and precision. As the dials moved, each brain received clearly and plainly a knowledge of the customs, language, and manners of the inhabitants of Norlamin. Each mind became suffused with a vast, immeasurable peace, calm power, and a depth and breadth of mental vision theretofore undreamed of. Looking deep into his mind they sensed a quiet, placid certainty, beheld power and knowledge to them illimitable, perceived depths of wisdom to them unfathomable.

Then from his mind into theirs there flowed smoothly a mighty stream of comprehension of cosmic phenomena. They hazily saw infinitely small units grouped into planetary formations to form practically dimensionless particles. These particles in turn grouped to form slightly larger ones, and after a long succession of such grouping they knew that the comparatively gigantic aggregates which then held their attention were in reality electrons and protons, the smallest units recognized by Earthly science. They clearly understood the combinations of these electrons and protons into atoms. They perceived plainly the way in which atoms build up molecules, and comprehended the molecular structure of matter. In mathematical thoughts, only dimly grasped even by Seaton and Crane, were laid before them the fundamental laws of physics, of electricity, of gravitation, and of chemistry. They saw globular aggregations of matter, the suns and their planets, comprising solar systems; saw solar systems, in accordance with those immutable laws, grouped into galaxies, galaxies in turn—here the flow was suddenly shut off as though a valve had been closed, and the astronomer spoke.

"Pardon me. Your brains should be stored only with the material you desire most and can use to the best advantage, for your mental capacity is even more limited than my own. Please understand that I speak in no derogatory sense; it is only that your race has many thousands of generations to go before your minds should be stored with knowledge indiscriminately. We ourselves have not yet reached that stage, and we are perhaps millions of years older than you. And yet," he continued musingly, "I envy you. Knowledge is, of

course, relative, and I can know *so* little! Time and space have yielded not an iota of their mystery to our most penetrant minds. And whether we delve baffled into the unknown smallness of the small, or whether we peer, blind and helpless, into the unknown largeness of the large, it is the same—infinity is comprehensible only to the Infinite One: the all-shaping Force directing and controlling the Universe and the unknowable Sphere. The more we know, the vaster the virgin fields of investigation open to us, and the more infinitesimal becomes our knowledge. But I am perhaps keeping you from more important activities. As you approach Norlamin more nearly, I shall guide you to my observatory. I am glad indeed that it is in my lifetime that you have come to us, and I await anxiously the opportunity of greeting you in the flesh. The years remaining to me of this cycle of existence are few, and I had almost ceased hoping to witness your coming."

THE projection vanished instantaneously, and the four stared at each other in an incredulous daze of astonishment. Seaton finally broke the stunned silence.

"Well, I'll be kicked to death by little red spiders!" he ejaculated. "Mart, did you see what I saw, or did I get tight on something without knowing it? That sure burned me up—it breaks me right off at the ankles, just to think of it!"

Crane walked to the educator in silence. He examined it, felt the changed coils and transformers, and gently shook the new insulating base of the great powertube. Still in silence he turned his back, walked around the instrument board, read the meters, then went back and again inspected the educator.

"It was real, and not a higher development of hypnotism, as at first I thought it must be," he reported seriously. "Hypnotism, if sufficiently advanced, might have affected us in that fashion, even to teaching us all a strange language, but by no possibility could it have had such an effect upon copper, steel, bakelite, and glass. It was certainly real, and while I cannot begin to understand it, I will say that your imagination has certainly vindicated itself. A race of beings, who can do such things as that, can do almost anything—you have been right, from the start."

"Then you can beat those horrible Fenachrone, after all!" cried Dorothy, and threw herself into her husband's arms.

"Do you remember, Dick, that I hailed you once as Columbus at San Salvador?" asked Margaret unsteadily from Crane's encircling arm. "What could a man be called who from the sheer depths of his imagination called forth the means of saving from destruction all the civilization of millions of entire worlds?"

"Don't talk that way, please, folks," Seaton was plainly very uncomfortable. He blushed intensely, the burning red tide rising in waves up to his hair as he wriggled in embarrassment, like any schoolboy. "Mart's done most of it, anyway, you know; and even at that, we ain't out of the woods yet, by forty-seven rows of apple trees."

"You will admit, will you not, that we can see our way out of the woods, at least, and that you yourself feel rather relieved?" asked Crane.

"I think we'll be able to pull their corks now, all right, after we get some dope. It's a cinch they've either got the stuff we need or know how to get it—and if that zone is impenetrable, I'll bet they'll be able to dope out something just as good. Relieved? That doesn't half tell it, guy—I feel as if I had just pitched off the Old Man of the Sea who's been sitting on my neck! What say you girls get your fiddle and guitar and we'll sing us a little song? I feel kind of relieved—they had me worried some—it's the first time I've felt like singing since we cut that warship up."

Dorothy brought out her "fiddle"—the magnificent Stradivarius, formerly Crane's, which he had given her—Margaret her guitar, and they sang one rollicking number after another. Though by no means a Metropolitan Opera quartette, their voices were all better than mediocre, and they had sung together so much that they harmonized readily.

"Why don't you play us some real music, Dottie?" asked Margaret, after a time. "You haven't practiced for ages."

"I haven't felt like playing lately, but I do now," and Dorothy stood up and swept the bow over the strings. Doctor of Music in violin, an accomplished musician, playing upon one of the finest instruments the world has ever known, she was lifted out of herself by relief from the dread of the Fenachrone invasion and that splendid violin expressed every subtle nuance of her thought.

She played rhapsodies and paeans, and solos by the great masters. She played vivacious dances, then "Traumerei" and "Liebestraum." At last she swept into the immortal "Meditation," and as the last note died away Seaton held out his arms.

"You're a blinding flash and a deafening report, Dottie Dimple, and I love you," he declared—and his eyes and his arms spoke volumes that his light utterance had left unsaid.

NORLAMIN close enough so that its image almost filled number six visiplate, the four wanderers studied it with interest. Partially obscured by clouds and with its polar regions two glaring caps of snow—they would be green in a few months, when the planet would swing inside the orbit of its sun around the vast central luminary of that complex solar system—it made a magnificent picture. They saw sparkling blue oceans and huge green continents of unfamiliar outlines. So terrific was the velocity of the space-cruiser, that the image grew larger as they watched it, and soon the field of vision could not contain the image of the whole disk.

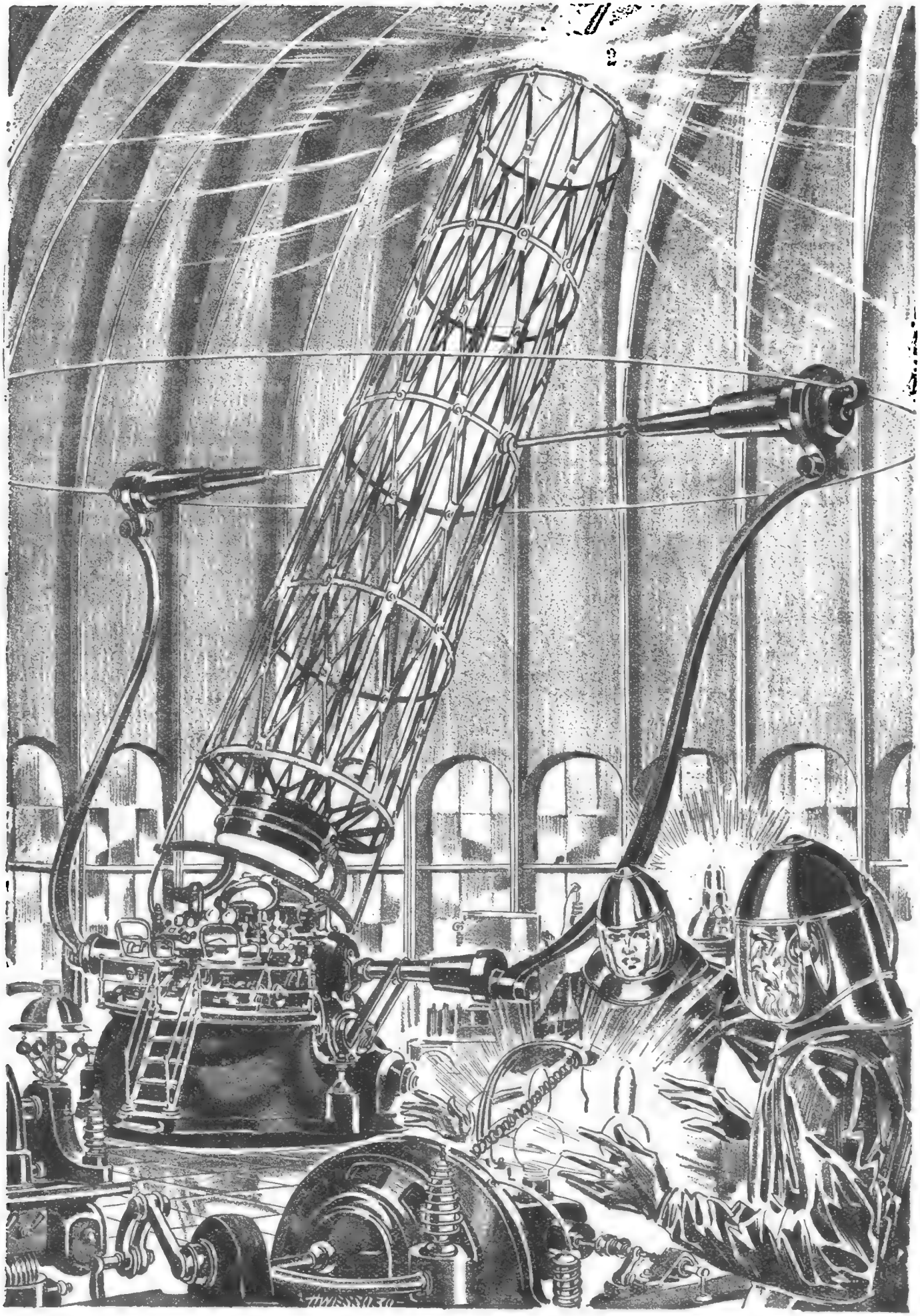
"Well, I expect Orlon'll be showing up pretty quick now," remarked Seaton; and it was not long until the projection appeared in the air of the control room.

"Hail, Terrestrials!" he greeted them. "With your permission, I shall direct your flight."

Permission granted, the figure floated across the room to the board and the rays of force centered the visiplate, changed the direction of the bar a trifle, decreased slightly their negative acceleration, and directed a stream of force upon the steering mechanism.

"We shall alight upon the grounds of my observatory upon Norlamin in seven thousand four hundred twenty-eight seconds," he announced presently. "The observatory will be upon the dark side of Norlamin when we arrive, but I have a force operating upon the steering mechanism which will guide the vessel along the required curved path. I

¶*Hour after hour Rovol labored on, oblivious to the passage of time in his zeal of accomplishment, the while carefully instructing Seaton, who watched every step with intense interest. . . .*



shall remain with you until we land, and we may converse upon any topic of most interest to you."

"We've got a topic of interest, all right. That's what we came out here for. But it would take too long to tell you about it—I'll show you!"

He brought out the magnetic brain record, threaded it into the machine and handed the astronomer a head-set. Orlon put it on, touched the lever, and for an hour there was unbroken silence as the monstrous brain of the menace was studied by the equally capable intellect of the Norlaminian scientist. There was no pause in the motion of the magnetic tape, no repetition—Orlon's brain absorbed the information as fast as it could be sent, and understood that frightful mind in every particular.

As the end of the tape was reached and the awful record ended, a shadow passed over Orlon's face.

"Truly a depraved evolution—it is sad to contemplate such a perversion of a really excellent brain. They have power, even as you have, and they have the will to destroy, which is a thing that I cannot understand. However, if it is graven upon the Sphere that we are to pass, it means only that upon the next plane we shall continue our searches—let us hope with better tools and with greater understanding than we now possess."

"'Smatter?" snapped Seaton gravely. "Going to take it lying down, without putting up any fight at all?"

"What can we do? Violence is contrary to our very natures. No man of Norlamin could offer any but passive resistance."

"You can do a lot if you will. Put on that headset again and get my plan, offering any suggestions your far abler brain may suggest."

As the human scientist poured his plan of battle into the brain of the astronomer, Orlon's face cleared.

"It is graven upon the Sphere that the Fenachrone shall pass," he said finally. "What you ask of us we can do. I have only a general knowledge of rays, as they are not in the province of the Orlon family; but the student Rovol, of the family Rovol of Rays, has all present knowledge of such phenomena. Tomorrow I will bring you together, and I have little doubt that he will be able, with the help of your metal of power, to solve your problem."

"I don't quite understand what you said about a whole family studying one subject, and yet having only one student in it," said Dorothy, in perplexity.

"A little explanation is perhaps necessary," replied Orlon. "First, you must know that every man of Norlamin is a student, and most of us are students of science. With us, 'labor' means mental effort, that is, study. We perform no physical or manual labor save for exercise, as all our mechanical work is done by forces. This state of things having endured for many thousands of years, it long ago became evident that specialization was necessary in order to avoid duplication of effort and to insure complete coverage of the field. Soon afterward, it was discovered that very little progress was being made in any branch, because so much was known that it took practically a lifetime to review that which had already been accomplished, even in a narrow and highly specialized field. Many points were studied for years before it was discovered that the identical work had been done before, and either forgotten or overlooked. To remedy this condition the mechanical educator had to be developed. Once it was perfected a new system was begun. One man was assigned to each small subdivision of scientific endeavor, to study it intensively. When he became old, each man chose a successor—usually a son—and transferred his own knowledge to the younger student. He also made a complete record of his own brain, in much the same way as you have recorded the brain of the Fenachrone upon your metallic tape. These records are all stored in a great central library, as permanent references.

"All these things being true, now a young person may need only finish an elementary education—just enough to learn to think, which takes only about twenty-five or thirty years—and then he is ready to begin actual work. When that time comes, he receives in one day all the knowledge of his specialty which has been accumulated by his predecessors during many thousands of years of intensive study."

"Whew!" Seaton whistled, "no wonder you folks know something! With that start, I believe I might know something myself! As an astronomer, you may be interested in this star-chart and stuff—or do you know all about that already?"

"No, the Fenachrone are far ahead of us in that subject, because of their observatories out in open space and because of their gigantic reflectors, which cannot be used through any atmosphere. We are further hampered in having darkness for only a few hours at a time and only in the winter, when our planet is outside the orbit of our sun around the great central sun of our entire system. However, with the Rvolon you have brought us, we shall have real observatories far out in space; and for that I personally will be indebted to you more than I can ever express. As for the chart, I hope to have the pleasure of examining it while you are conferring with Rovol of Rays."

"How many families are working on rays—just one?"

"One upon each kind of ray. That is, each of the ray families knows a great deal about all kinds of vibrations of the ether, but is specializing upon one narrow field. Take, for instance, the rays you are most interested in; those able to penetrate a zone of force. From my own very slight and general knowledge I know that it would of necessity be a ray of the fifth order. These rays are very new—they have been under investigation only a few hundred years—and the Rovol is the only student who would be at all well informed upon them. Shall I explain the orders of rays more fully than I did by means of the educator?"

"Please. You assumed that we knew more than we do, so a little explanation would help."

"All ordinary vibrations—that is, all molecular and material ones, such as light, heat, electricity, radio, and the like—were arbitrarily called waves of the first order; in order to distinguish them from waves of the second order, which are given off by particles of the second order, which you know as protons and electrons, in their combination to form atoms. Your scientist Millikan discovered these rays for you, and in your language they are known as Millikan, or Cosmic, rays.

"SOME time later, when sub-electrons were identified, the rays given off by their combination into electrons, or by the disruption of electrons, were called rays of the third order. These rays are most interesting and most useful; in fact, they do all our mechanical work. They as a class are called protelectricity, and bear the same relation to ordinary electricity that electricity does to torque—both are pure energy, and they are inter-convertible. Unlike electricity, however, it may be converted into many different forms by fields of force, in a

way comparable to that in which white light is resolved into colors by a prism—or rather, more like the way alternating current is changed to direct current by a motor-generator set, with attendant changes in properties. There is a complete spectrum of more than five hundred factors, each as different from the others as red is different from green.

"Continuing farther, particles of the fourth order give rays of the fourth order; those of the fifth, rays of the fifth order. Fourth-order rays have been investigated quite thoroughly, but only mathematically and theoretically, as they are of excessively short wavelength and are capable of being generated only by the breaking down of matter itself into the corresponding particles. However, it has been shown that they are quite similar to protelectricity in their general behavior. Thus, the power that propels your space-vessel, your attractors, your repellers, your object-compass, your zone of force—all these things are simply a few of the many hundreds of wave-bands of the fourth order, all of which you doubtless would have worked out for yourselves in time. Very little is known, even in theory, of the rays of the fifth order, although they have been shown to exist."

"For a man having no knowledge, you seem to know a lot about rays. How about the fifth order—is that as far as they go?"

"My knowledge is slight and very general; only such as I must have in order to understand my own subject. The fifth order certainly is not the end—it is probably scarcely a beginning. We think now that the orders extend to infinite smallness, just as the galaxies are grouped into larger aggregations, which are probably in their turn only tiny units in a scheme infinitely large.

"Over six thousand years ago the last third order rays were worked out; and certain peculiarities in their behavior led the then Rovol to suspect the existence of the fourth order. Successive generations of the Rovol proved their existence, determined the conditions of their liberation, and found that this metal of power was the only catalyst able to decompose matter and thus liberate the rays. This metal, which was called Rovolon after the Rovol, was first described upon theoretical grounds and later was found, by spectroscopy, in certain stars, notably in one star only eight light-years away, but not even the most infinitesimal trace of it exists in our entire solar system. Since these discoveries, the many Rovol have been perfecting the theory of the fourth order, beginning that of the fifth, and waiting for your coming. The present Rovol, like myself and many others whose work is almost at a standstill, is waiting with all-consuming interest to greet you, as soon as the *Skylark* can be landed upon our planet."

"Neither your rocket-ships nor your projections could get you any Rovolon?"

"No. Every hundred years or so someone develops a new type of rocket that he thinks may stand a slight chance of making the journey, but not one of these venturesome youths has as yet returned. Either that sun has no planets or else the rocket-ships have failed. Our projections are useless, as they can be driven only a very short distance upon our present carrier wave. With a carrier of the fifth order we could drive a projection to any point in the galaxy, since its velocity would be millions of times that of light and the power necessary reduced accordingly—but as I said before, such waves cannot be generated without the metal Rovolon."

"I hate to break this up—I'd like to listen to you talk for a week—but we're going to land pretty quick, and it looks as though we were going to land pretty hard."

"We will land soon, but not hard," replied Orlon confidently, and the landing was as he had foretold. The *Skylark* was falling with an ever-decreasing velocity, but so fast was the descent that it seemed to the watchers as though they must crash through the roof of the huge, brilliantly lighted building upon which they were dropping and bury themselves many feet in the ground beneath it. But they did not strike the observatory. So incredibly accurate were the calculations of the Norlaminian astronomer and so inhumanly precise were the controls he had set upon their bar, that, as they touched the ground after barely clearing the domed roof and he shut off their power, the passengers felt only a sudden decrease in acceleration, like that following the coming to rest of a rapidly moving elevator, after it has completed a downward journey.

"I shall join you in person very shortly," Orlon said, and the projection vanished.

"Well, we're here, folks, on another new world. Not quite as thrilling as the first one was, is it?" and Seaton stepped toward the door.

"How about the air composition, density, gravity, temperature, and so on?" asked Crane. "Perhaps we should make a few tests."

"Didn't you get that on the educator? Thought you did. Gravity a little less than seven-tenths. Air composition, same as Osnome and Dasor. Pressure, half-way between Earth and Osnome. Temperature, like Osnome most of the time, but fairly comfortable in the winter. Snow now at the poles, but this observatory is only ten degrees from the equator. They don't wear clothes enough to flag a hand-car with here, either, except when they have to. Let's go!"

HE opened the door and the four travelers stepped out upon a close-cropped lawn—a turf whose blue-green softness would shame an Oriental rug. The landscape was illuminated by a soft and mellow, yet intense green light which emanated from no visible source. As they paused and glanced about them, they saw that the *Skylark* had alighted in the exact center of a circular enclosure a hundred yards in diameter, walled by row upon row of shrubbery, statuary, and fountains, all bathed in ever-changing billows of light. At only one point was the circle broken. There the walls did not come together, but continued on to border a lane leading up to the massive structure of cream-and-green marble, topped by its enormous, glassy dome—the observatory of Orlon.

"Welcome to Norlamin, Terrestrials," the deep, calm voice of the astronomer greeted them, and Orlon in the flesh shook hands cordially in the American fashion with each of them in turn, and placed around each neck a crystal chain from which depended a small Norlaminian chronometer-radiophone. Behind him there stood four other old men.

"These men are already acquainted with each of you, but you do not as yet know them. I present Fodan, Chief of the Five of Norlamin. Rovol, about whom you know. Astron, the First of Energy. Satrazon, the First of Chemistry."

Orlon fell in beside Seaton and the party turned toward the observatory. As they walked along the Earth-people stared, held by the unearthly beauty of the

grounds. The hedge of shrubbery, from ten to twenty feet high, and which shut out all sight of everything outside it, was one mass of vivid green and flaring crimson leaves; each leaf and twig groomed meticulously into its precise place in a fantastic geometrical scheme. Just inside this boundary there stood a ring of statues of heroic size. Some of them were single figures of men and women; some were busts; some were groups in natural or allegorical poses—all were done with consummate skill and feeling. Between the statues there were fountains, magnificent bronze and glass groups of the strange aquatic denizens of this strange planet, bathed in geometrically shaped sprays, screens, and columns of water. Winding around between the statues and the fountains there was a moving, scintillating wall, and upon the waters and upon the wall there played torrents of color, cataracts of harmoniously blended light. Reds, blues, yellows, greens—every color of their peculiar green spectrum and every conceivable combination of those colors writhed and flamed in ineffable splendor upon those deep and living screens of falling water and upon that shimmering wall.

As they entered the lane, Seaton saw with amazement that what he had supposed a wall, now close at hand, was not a wall at all. It was composed of myriads of individual sparkling jewels, of every known color, for the most part self-luminous; and each gem, apparently entirely unsupported, was dashing in and out and along among its fellows, weaving and darting here and there, flying at headlong speed along an extremely tortuous, but evidently carefully calculated course.

"What can that be, anyway, Dick?" whispered Dorothy, and Seaton turned to his guide.

"Pardon my curiosity, Orlon, but would you mind explaining the why of that moving wall? We don't get it."

"Not at all. This garden has been the private retreat of the family of Orlon for many thousands of years, and women of our house have been beautifying it since its inception. You may have observed that the statuary is very old. No such work has been done for ages. Modern art has developed along the lines of color and motion, hence the lighting effects and the tapestry wall. Each gem is held upon the end of a minute pencil of force, and all the pencils are controlled by a machine which has a key for every jewel in the wall."

Crane, the methodical, stared at the innumerable flashing jewels and asked, "It must have taken a prodigious amount of time to complete such an undertaking?"

"It is far from complete; in fact, it is scarcely begun. It was started only about four hundred years ago."

"Four hundred years!" exclaimed Dorothy. "Do you live that long? How long will it take to finish it, and what will it be like when it is done?"

"No, none of us live longer than about one hundred and sixty years—at about that age most of us decide to pass. When this tapestry wall is finished, it will not be simply form and color, as it is now. It will be a portrayal of the history of Norlamin from the first cooling of the planet. It will, in all probability, require thousands of years for its completion. You see, time is of little importance to us, and workmanship is everything. My companion will continue working upon it until we decide to pass; my son's companion may continue it. In any event, many generations of the women of the Orlon will work upon it until it is complete. When it is done, it will be a thing of beauty as long as Norlamin shall endure."

"But suppose that your son's wife isn't that kind of an artist? Suppose she should want to do music or painting or something else?" asked Dorothy, curiously.

"That is quite possible; for, fortunately, our art is not yet entirely intellectual, as is our music. There are many unfinished artistic projects in the house of Orlon, and if the companion of my son should not find one to her liking, she will be at liberty to continue anything else she may have begun, or to start an entirely new project of her own."

"You have a family, then?" asked Margaret, "I'm afraid I didn't understand things very well when you gave them to us over the educator."

"I sent things too fast for you, not knowing that your educator was new to you; a thing with which you were not thoroughly familiar. I will therefore explain some things in language, since you are not familiar with the mechanism of thought transference. The Five, a self-perpetuating body, do what governing is necessary for the entire planet. Their decrees are founded upon self-evident truth, and are therefore the law. Population is regulated according to the needs of the planet, and since much work is now in progress, an increase in population was recommended by the Five. My companion and I therefore had three children, instead of the customary two. By lot it fell to us to have two boys and one girl. One of the boys will assume my duties when I pass; the other will take over a part of some branch of science that has grown too complex for one man to handle as a specialist should. In fact, he has already chosen his specialty and been accepted for it—he is to be the nine hundred and sixty-seventh of Chemistry, the student of the asymmetric carbon atom, which will thus be his specialty from this time henceforth.

"It was learned long ago that the most perfect children were born of parents in the full prime of mental life, that is, at one hundred years of age. Therefore, with us each generation covers one hundred years. The first twenty-five years of a child's life are spent at home with his parents, during which time he acquires his elementary education in the common schools. Then boys and girls alike move to the Country of Youth, where they spend another twenty-five years. There they develop their brains and initiative by conducting any researches they choose. Most of us, at that age, solve all the riddles of the Universe, only to discover later that our solutions have been fallacious. However, much really excellent work is done in the Country of Youth, primarily because of the new and unprejudiced viewpoints of the virgin minds there at work. In that country also each finds his life's companion, the one necessary to round out mere existence into a perfection of living that no person, man or woman, can ever know alone. I need not speak to you of the wonders of love or of the completion and fullness of life that it brings, for all four of you, children though you are, know love in full measure.

"At fifty years of age the man, now mentally mature, is recalled to his family home, as his father's brain is now losing some of its vigor and keenness. The father then turns over his work to the son by means of the educator—and when the weight of the accumulated knowledge of a hundred thousand generations of research is impressed upon the son's brain, his play is over."

"What does the father do then?"

"Having made his brain record, about which I have told you, he and his companion—for she has in similar fashion turned over her work to her successor—retire to the Country of Age, where they rest and relax after their century of effort. They do whatever they care to do, for as long as they please to do it. Finally, after assuring themselves that all is well with the children, they decide that they are ready for the Change. Then, side by side as they have labored, they pass."

Now at the door of the observatory, Dorothy paused and shrank back against Seaton, her eyes widening as she stared at Orlon.

"No, daughter, why should we fear the Change?" he answered her unspoken question, calm serenity in every inflection of his quiet voice. "The life-principle is unknowable to the finite mind, as is the All-Controlling Force. But even though we know nothing of the sublime goal toward which it is trending, any person ripe for the Change can, and of course does, liberate the life-principle so that its progress may be unimpeded."

IN a spacious room of the observatory, in which the Terrestrials and their Norlaminian hosts had been long engaged in study and discussion, Seaton finally rose and extended a hand toward his wife.

"Well, that's that, then, Orlon, I guess. We've been thirty hours without sleep, and for us that's a long time. I'm getting so dopey I can't think a lick. We'd better go back to the *Skylark* and turn in, and after we've slept nine hours or so I'll go over to Rovol's laboratory and Crane'll come back here to you."

"You need not return to your vessel" said Orlon. "I know that its somewhat cramped quarters have become irksome. Apartments have been prepared here for you. We shall have a meal here together, and then we shall retire, to meet again tomorrow."

As he spoke a tray laden with appetizing dishes appeared in the air in front of each person. As Seaton resumed his seat the tray followed him, remaining always in the most convenient position.

Crane glanced at Seaton questioningly, and Satrazon, the First of Chemistry, answered his thought before he could voice it.

"The food before you, unlike that which is before us of Normalin, is wholesome for you. It contains no copper, no arsenic, no heavy metals—in short, nothing in the least harmful to your chemistry. It is balanced as to carbohydrates, proteins, fats, and sugars, and contains the due proportion of each of the various accessory nutritional factors. You will also find the flavors are agreeable to each of you."

"Synthetic, eh? You've got us analyzed," Seaton stated, rather than asked, as with knife and fork he attacked the thick, rare, and beautifully broiled steak which, with its mushrooms and other delicate trimmings, lay upon his rigid although unsupported tray—noticing as he did so that the Norlaminians ate with tools entirely different from those they had supplied to their Earthly guests.

"Entirely synthetic," Satrazon made answer, "except for the sodium chloride necessary. As you already know, sodium and chlorin are very rare throughout our system, therefore the force upon the food-supply took from your vessel the amount of salt required for the formula. We have been unable to synthesize atoms, for the same reason that the labors of so many others have been hindered—because of the lack of Rovolon. Now, however, my science shall progress as it should; and for that I join with my fellow scientists in giving you thanks for the service you have rendered us."

"We thank you instead," replied Seaton, "for the service we have been able to do you is slight indeed compared to what you are giving us in return. But it seems that you speak quite impersonally of the force upon the food supply. Did you yourself direct the preparation of these meats and vegetables?"

"Oh, no. I merely analyzed your tissues, surveyed the food-supplies you carried, discovered your individual preferences, and set up the necessary integrals in the mechanism. The forces did the rest, and will continue to do so as long as you remain upon this planet."

"Fruit salad always my favorite dish," Dorothy said, after a couple of bites, "and this one is just too perfectly divine! It doesn't taste like any other fruit I ever ate, either—I think it must be the same ambrosia that the old pagan gods used to eat."

"If all you did was to set up the integrals, how do you know what you are going to have for the next meal?" asked Crane.

"We have no idea what the form, flavor, or consistency of any dish will be," was the surprising answer. "We know only that the flavor will be agreeable and that it will agree with the form and consistency of the substance, and that the composition will be well-balanced chemically. You see, all the details of flavor, form, texture, and so on are controlled by a device something like one of your kaleidoscopes. The integrals render impossible any unwholesome, unpleasant, or unbalanced combination of any nature, and everything else is left to the mechanism, which operates upon pure chance."

"*Some system,* I'd rise to remark," and Seaton, with the others, resumed his vigorous attack upon the long-delayed supper.

The meal over, the Earthly visitors were shown to their rooms, and fell into a deep, dreamless sleep.

CHAPTER X

Norlaminian Science

BREAKFAST over, Seaton watched intently as his tray, laden with empty containers, floated away from him and disappeared into an opening in the wall.

"How do you do it, Orlon?" he asked, curiously. "I can hardly believe it, even after seeing it done."

"Each tray is carried upon the end of a beam or rod of force, and supported rigidly by it. Since the beam is tuned to the individual wave of the instrument you wear upon your chest, your tray is, of course, placed in front of you; at a predetermined distance, as soon as the sending force is actuated. When you have finished your meal, the beam is shortened. Thus the tray is drawn back to the food laboratory, where other forces cleanse and sterilize the various utensils and place them in readiness for the next meal. It would be an easy matter to have this same mechanism place your meals before you wherever you may go upon this planet, provided only that a clear path can be plotted from the laboratory to your person."

"Thanks, but it wouldn't pay. No telling where we'd be. Besides, we'd better eat in the *Skylark* most of the

time, to keep our cook good-natured. Well, I see Rovol's got his boat here for me, so guess I'd better turn up a few r. p. m. Coming along, Dot, or have you got something else on your mind?"

"I'm going to leave you for a while. I can't really understand even a radio, and just thinking about those funny, complicated rays and things you are going after makes me dizzy in the head. Mrs. Orlon is going to take us over to the Country of Youth—she says Margaret and I can play around with her daughter and her bunch and have a good time while you scientists are doing your stuff."

"All right. 'Bye till tonight," and Seaton stepped out into the grounds, where the First of Rays was waiting.

The flier was a torpedo-shaped craft of some transparent, glassy material, completely enclosed except for one circular opening or doorway. From the midsection, which was about five feet in diameter and provided with heavily-cushioned seats capable of carrying four passengers in comfort, the hull tapered down smoothly to a needle point at each end. As Seaton entered and settled himself into the cushions, Rovol touched a lever. Instantly a transparent door slid across the opening, locking itself into position flush with the surface of the hull, and the flier darted into the air and away. For a few minutes there was silence, as Seaton studied the terrain beneath them. Fields or cities there were none; the land was covered with dense forests and vast meadows, with here and there great buildings surrounded by gracious, park-like areas. Rovol finally broke the silence.

"I understand your problem, I believe, since Orlon has transferred to me all the thoughts he had from you. With the aid of the Rovolon you have brought us, I am confident that we shall be able to work out a satisfactory solution of the various problems involved. It will take us some few minutes to traverse the distance to my laboratory, and if there are any matters upon which your mind is not quite clear, I shall try to clarify them."

"That's letting me down easy," Seaton grinned, "but you don't need to be afraid of hurting my feelings—I know just exactly how ignorant and dumb I am compared to you. There's a lot of things I don't get at all. First, and nearest, this airboat. It has no power-plant at all. I assume that it, like so many other things hereabouts, is riding on the end of a rod of force?"

"Exactly. The beam is generated and maintained in my laboratory. All that is here in the flier is a small sender, for remote control."

"How do you obtain your power?" asked Seaton. "Solar generators and tide motors? I know that all your work is done by protelectricity, but Orlon did not inform us as to the sources."

"We have not used such inefficient generators for many thousands of years. Long ago it was shown by research that these rays were constantly being generated in abundance in outer space, and that they could be collected upon spherical condensers and transmitted without loss to the surface of the planet by means of matched and synchronized crystals. Several millions of these condensers have been built and thrown out to become tiny satellites of Norlamin."

"How did you get them far enough out?"

"The first ones were forced out to the required distance upon beams of force produced by the conversion of electricity, which was in turn produced from turbines, solar motors, and tide motors. With a few of them out, however, it was easy to obtain sufficient power to send out more; and now, whenever one of us requires more power than he has at his disposal, he merely sends out such additional collectors as he needs."

"Now about those fifth-order rays, which will penetrate a zone of force. I am told that they are not ether waves at all?"

"They are not ether waves. The fourth order rays, of which the theory has been completely worked out, are the shortest vibrations that can be propagated through the ether; for the ether itself is not a continuous medium. We do not know its nature exactly, but it is an actual substance, and is composed of discrete particles of the fourth order. Now the zone of force, which is itself a fourth-order phenomenon, sets up a condition of stasis in the particles composing the ether. These particles are relatively so coarse, that rays and particles of the fifth order will pass through the fixed zone without retardation. Therefore, if there is anything between the particles of the ether—this matter is being debated hotly among us at the present time—it must be a sub-ether, if I may use that term. We have never been able to investigate any of these things experimentally, not even such a coarse aggregation as is the ether; but now, having Rovolon, it will not be many thousands of years until we shall have extended our knowledge many orders farther, in both directions."

"Just how will Rovolon help you?"

"It will enable us to generate a force of the ninth magnitude—that much power is necessary to set up what you have so aptly named a zone of force—and will give us a source of fourth, fifth, and probably higher orders of rays which, if they are generated in space at all, are beyond our present reach. The zone of force is necessary to shield certain items of equipment from ether vibrations; as any such vibration inside the controlling fields of force renders observation or control of the higher orders of rays impossible."

"Hm . . . m, I see—I'm learning something," Seaton replied cordially. "Just as the higher-powered a radio set is, the more perfect must be its shielding?"

"Yes. Just as a trace of any gas will destroy the usefulness of your most sensitive vacuum tubes, and just as imperfect shielding will allow interfering waves to enter sensitive electrical apparatus—in that same fashion will even the slightest ether vibration interfere with the operation of the extremely sensitive fields and lenses of force which must be used in controlling forces of the higher orders."

"You haven't tested the theory of the fourth order yet, have you?"

"No, but that is unnecessary. The theory of the fourth order is not really theory at all—it is mathematical fact. Although we have never been able to generate them, we know exactly the forces you use in your ship of space, and we can tell you of some thousands of others more or less similar and also highly useful forces which you have not yet discovered, but are allowing to go to waste. We know exactly what they are, how to liberate and control them, and how to use them. In fact, in the work which we are to begin today, we shall use but little ordinary power: almost all our work will be done by fourth-order forces, liberated from copper by means of the Rovolon you have given me. But here we are at my laboratory. You already know that the best way to learn is by doing, and we shall begin at once."

THE flier alighted upon a lawn quite similar to the one before the observatory of Orlon, and the scientist led his Earthly guest through the main entrance of the imposing structure of vari-colored marble and gleaming metal and into the vast, glass-lined room that was his laboratory. Great benches lined the walls, and there were hundreds of dials, meters, tubes, transformers, and other instruments, whose uses Seaton could not even guess.

Rovol first donned a suit of transparent, flexible material, of a deep golden color, instructing Seaton to do the same; explaining that much of the work would be with dangerous frequencies and with high pressures, and that the suits were not only absolute insulators against electricity, heat, and sound, but were also ray-filters proof against any harmful radiations. As each helmet was equipped with radiophones, conversation was not interfered with in the least.

Rovol took up a tiny flash-pencil, and with it deftly cut off a bit of Rovolon, almost microscopic in size. This he placed upon a great block of burnished copper, and upon it played a force. As he manipulated two levers, two more beams of force flattened out the particle of metal, spread it out over the copper, and forced it into the surface of the block until the thin coating was at every point in molecular contact with the copper beneath it—a perfect job of plating, and one done in the twinkling of an eye. He then cut out a piece of the treated copper the size of a pea, and other forces rapidly built around it a structure of coils and metallic tubes. This apparatus he suspended in the air at the extremity of a small beam of force. The block of copper was next cut in two, and Rovol's fingers moved rapidly over the keys of a machine which resembled slightly an overgrown and exceedingly complicated book-keeping machine. Streams and pencils of force flashed and crackled, and Seaton saw raw materials transformed into a complete power-plant, in its center the two-hundred-pound lump of plated copper, where an instant before there had been only empty space upon the massive metal bench. Rovol's hands moved rapidly from keys to dials and back, and suddenly a zone of force, as large as a basketball, appeared around the apparatus poised in the air.

"But it'll fly off and we can't stop it with anything," Seaton protested, and it did indeed dart rapidly upward.

The old man shook his head as he manipulated still more controls, and Seaton gasped as nine stupendous beams of force hurled themselves upon that brilliant spherical mirror of pure energy, seized it in mid-flight, and shaped it resistlessly, under his bulging eyes, into a complex geometrical figure of precisely the desired form.

Lurid violet light filled the room, and Seaton turned toward the bar. That two-hundred-pound mass of copper was shrinking visibly, second by second, so vast were the forces being drawn from it, and the searing, blinding light would have been intolerable but for the protective color-filters of his helmet. Tremendous flashes of lightning ripped and tore from the relief-points of the bench to the ground-rods, which flared at blue-white temperature under the incessant impacts. Knowing that this corona-loss was but an infinitesimal fraction of the power being used, Seaton's very mind staggered as he strove to understand the magnitude of the forces at work upon that stubborn sphere of energy.

The aged scientist used no tools whatever, as we understand the term. His laboratory was a power-house; at his command were the stupendous forces of a battery of planetoid accumulators, and added to these were the fourth-order, ninth-magnitude forces of the disintegrating copper bar. Electricity, protelectricity, and fourth-order rays, under millions upon millions of kilovolts of pressure, leaped to do the bidding of that wonderful brain, stored with the accumulated knowledge of countless thousands of years of scientific research. Watching the ancient physicist work, Seaton compared himself to a schoolboy mixing chemicals indiscriminately and ignorantly, with no knowledge whatever of their properties, occasionally obtaining a reaction by pure chance. Whereas he had worked with intra-atomic energy schoolboy fashion, the master craftsman before him knew every reagent, every reaction, and worked with known and thoroughly familiar agencies to bring about his exactly predetermined ends—just as calmly certain of the results as Seaton himself would have been in his own laboratory, mixing equivalent quantities of solutions of barium chloride and of sulphuric acid to obtain a precipitate of barium sulphate.

Hour after hour Rovol labored on, oblivious to the passage of time in his zeal of accomplishment, the while carefully instructing Seaton, who watched every step with intense interest and did everything possible for him to do. Bit by bit a towering structure arose in the middle of the laboratory. A metal foundation supported a massive compound bearing, which in turn carried a tubular network of latticed metal, mounted like an immense telescope. Near the upper, outer end of this openwork tube a group of nine forces held the field of force rigidly in place in its axis; at the lower extremity were mounted seats for two operators and the control panels necessary for the operation of the intricate system of forces and motors which would actuate and control that gigantic projector. Immense hour and declination circles could be read by optical systems from the operators' seats—circles fully forty feet in diameter, graduated with incredible delicacy and accuracy into decimal fractions of seconds of arc, and each driven by variable-speed motors through gear-trains and connections having no backlash whatever.

While Rovol was working upon one of the last instruments to be installed upon the controlling panel a mellow note sounded throughout the building, and he immediately ceased his labors and opened the master-switches of his power plants.

"You have done well, youngster," he congratulated his helper, as he began to take off his protective covering, "Without your aid I could not have accomplished nearly this much during one period of labor. The periods of exercise and of relaxation are at hand—let us return to the house of Orlon, where we all shall gather to relax and to refresh ourselves for the labors of tomorrow."

"But it's almost done!" protested Seaton. "Let's finish it up and shoot a little juice through it, just to try it out."

"There speaks the rashness and impatience of youth," rejoined the scientist, calmly removing the younger man's suit and leading him out to the waiting airboat. "I read in your mind that you are often guilty of laboring continuously until your brain loses its keen edge. Learn now, once and for all, that such conduct is worse than foolish—it is criminal. We have labored the full period. Laboring for more than that length of time

without recuperation results in a loss of power which, if persisted in, wreaks permanent injury to the mind; and by it you gain nothing. We have more than ample time to do that which must be done—the fifth-order projector shall be completed before the warning torpedo shall have reached the planet of the Fenachrone—therefore over-exertion is unwarranted. As for testing, know now that only mechanisms built by bunglers require testing. Properly built machines work properly."

"But I'd have liked to see it work just once, anyway," lamented Seaton as the small airship tore through the air on its way back to the observatory.

"You must cultivate calmness, my son, and the art of relaxation. With those qualities your race can easily double its present span of useful life. Physical exercise to maintain the bodily tissues at their best, and mental relaxation following mental toil—these things are the secrets of a long and productive life. Why attempt to do more than can be accomplished efficiently? There is always tomorrow. I am more interested in that which we are now building than you can possibly be, since many generations of the Rovol have anticipated its construction; yet I realize that in the interest of our welfare and for the progress of civilization, today's labors must not be prolonged beyond today's period of work. Furthermore, you yourself realize that there is no optimum point at which any task may be interrupted. Short of final completion of any project, one point is the same as any other. Had we continued, we would have wished to continue still farther, and so on without end."

"You're probably right, at that," the impetuous chemist conceded, as their craft came to earth before the observatory.

CRANE and Orlon were already in the common room, as were the scientists Seaton already knew, as well as a group of women and children still strangers to the Terrestrials. In a few minutes Orlon's companion, a dignified, white-haired woman, entered; accompanied by Dorothy, Margaret, and a laughing, boisterous group of men and women from the Country of Youth. Introductions over, Seaton turned to Crane.

"How's every little thing, Mart?"

"Very well indeed. We are building an observatory in space—or rather, Orlon is building it and I am doing what little I can to help him. In a few days we shall be able to locate the system of the Fenachrone. How is your work progressing?"

"Smoother than a kitten's ear. Got the fourth-order projector about done. We're going to project a fourth-order force out to grab us some dense material, a pretty close approach to pure neutronium. There's nothing dense enough around here, even in the core of the central sun, so we're going out to a white dwarf star—one a good deal like the companion star to Sirius in Canis Major—get some material of the proper density from its core, and convert our sender into a fifth-order machine. Then we can really get busy—go places and do things."

"Neutronium? Pure mass?" queried Crane, "I have been under the impression that it does not exist. Of what use can such a substance be to you?"

"Can't get pure neutronium, of course—couldn't use it if we could. What we need and are going to get is a material of about two and a half million specific gravity. Got to have it for lenses and controls for the fifth-order forces. Those rays go right through anything less dense without measurable refraction. But I see Rovol's giving me a nasty look. He's my boss on this job, and I imagine this kind of talk's barred during the period of relaxation, as being work. That so, chief?"

"You know that it is barred, you incorrigible young cub!" answered Rovol, with a smile.

"All right, boss; one more little infraction and I'll shut up like a clam. I'd like to know what the girls have been doing."

"We've been having a wonderful time!" Dorothy declared. "We've been designing fabrics and ornaments and jewels and things. Wait 'til you see 'em!"

"Fine! All right, Orlon, it's your party—what to do?"

"This is the time of exercise. We have many forms, most of which are unfamiliar to you. You all swim, however, and as that is one of the best of exercises, I suggest that we all swim."

"Lead us to it!" Seaton exclaimed, then his voice changed abruptly. "Wait a minute—I don't know about our swimming in copper sulphate solution."

"We swim in fresh water as often as in salt, and the pool is now filled with distilled water."

The Terrestrials quickly donned their bathing suits and all went through the observatory and down a winding path, bordered with the peculiarly beautiful scarlet and green shrubbery, to the "pool"—an artificial lake covering a hundred acres, its polished metal bottom and sides strikingly decorated with jewels and glittering tiles in tasteful yet contrasting inlaid designs. Any desired depth of water was available and plainly marked, from the fenced-off shallows where the smallest children splashed to the forty feet of liquid crystal which received the diver who cared to try his skill from one of the many spring-boards, flying rings, and catapults which rose high into the air a short distance away from the entrance.

Orlon and the others of the older generation plunged into the water without ado and struck out for the other shore, using a fast double-overarm stroke. Swimming in a wide circle they came out upon the apparatus and went through a series of methodical dives and gymnastic performances. It was evident that they swam, as Orlon had intimated, for exercise. To them, exercise was a necessary form of labor—labor which they performed thoroughly and well—but nothing to call forth the whole-souled enthusiasm they displayed in their chosen fields of mental effort.

The visitors from the Country of Youth, however, locked arms and sprang to surround the four Terrestrials, crying, "Let's do a group dive!"

"I don't believe that I can swim well enough to enjoy what's coming," whispered Margaret to Crane, and they slipped into the pool and turned around to watch. Seaton and Dorothy, both strong swimmers, locked arms and laughed as they were encircled by the green phalanx and swept out to the end of a dock-like structure and upon a catapult.

END OF PART II.

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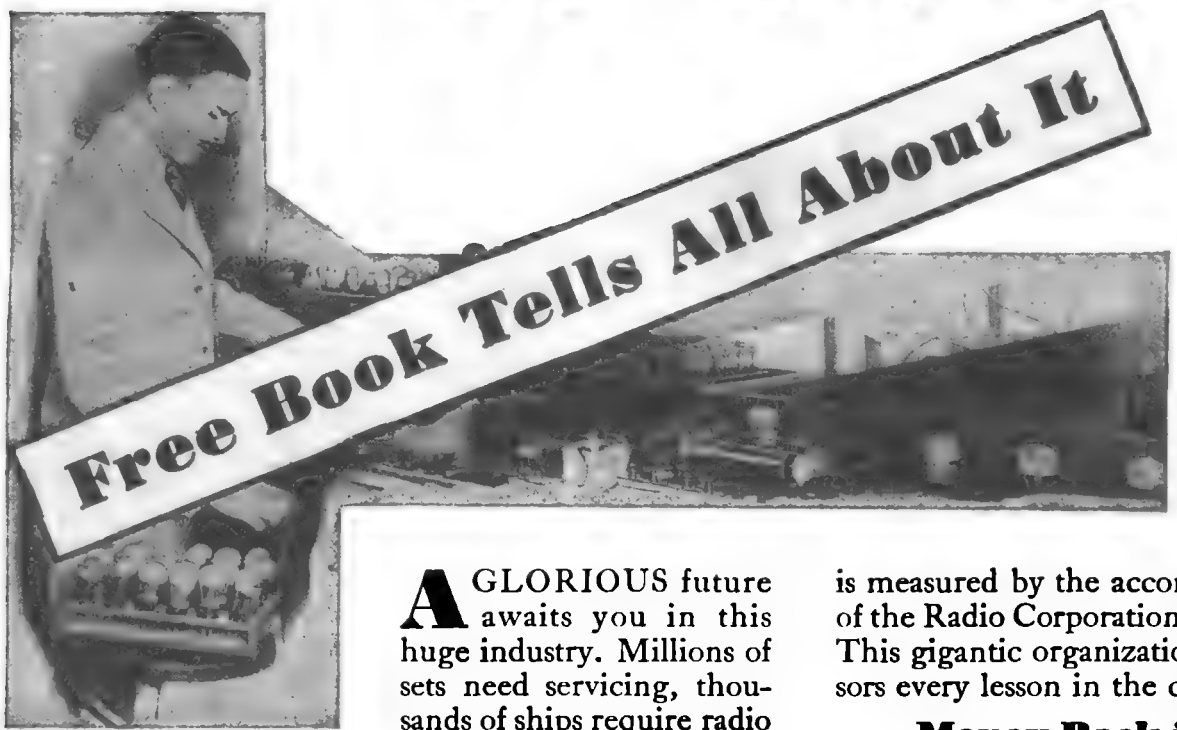

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Free Energy

By Harl Vincent

(*Continued from page 534*)

"Huxley!" The erstwhile power magnate gulped and faced him squarely. "Huxley," he repeated, "you've done right and I thank you for what you have done. I'll come back, boy. Got it in me, you know. And I'll make amends yet—for many things. You've taught me a lesson such as no man's been taught before. So help me, I'll keep my word."

The older man gazed into his eyes pleadingly.

"I believe you, Mr. Shapley," said Alan.

"You can, my boy. And now—before you go—may I ask you one favor?"

"Certainly. I hold no further grudge. We're even."

"Let me take your hand, Huxley. You're a *man* and I want to remember that I've shaken hands with one—a *real* one."

Silently they gripped.

THE END.

The Inferiority Complex

By Miles J. Breuer, M.D.

(*Continued from page 539*)

for thus his friends would feel that he had accomplished a marvelous scientific feat."

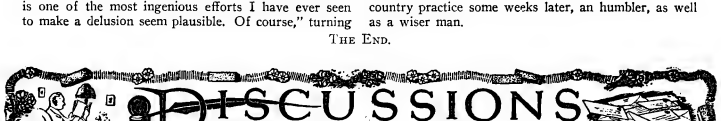
"But!" I interrupted, digging into my inside pocket, regardless of how ridiculous I must have looked, interrupting the proceedings; "the photographs!"

"Ah!" said Dr. Kuh. He was glad to see the photographs, and passed them around. "Very ingenious. Merely shows to what lengths a trained and educated mind will go, when its functions become dissociated. This is one of the most ingenious efforts I have ever seen to make a delusion seem plausible. Of course," turning to me, "any photographer can explain to you how to fake a picture like these you have handed me.

"Micromania," he went on to the students, "is merely one of the forms assumed by the *depressive* psychosis. The mild form of it is popularly well comprehended under the colloquial name of 'inferiority complex.' You have before you an extreme case of that innocent failing."

"Poor Twitchett!" I thought. I went back to my country practice some weeks later, an humbler, as well as a wiser man.

THE END.



In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

A LETTER FROM A CHEMICAL STUDENT

Editor, AMAZING STORIES:

I have just finished reading the discussions in the June issue of AMAZING STORIES. I was interested, particularly, in the letter of Mr. Otto Binder. He tells us of "something worth-while." But is it? There is certainly room for doubt in some of his statements. Chlorine is not extremely soluble in water and even if there was a great deal of water on the planet, its acidity would be low. If iron was dropped through the atmosphere to the planet, the surface of the iron would most likely be changed into a chloride before the iron struck the planet. Now suppose the iron was unaltered when it entered the acid sea, the acidity of the water would not likely be great enough to produce enough hydrogen to cause an explosion. And anyway, in order for chlorine and hydrogen to combine and cause an explosion, they must be in direct sunlight. The chlorine atmosphere would disperse the sun's rays.

Mr. Binder also states in his letter that "chlorine, in direct sunlight, decomposes water, forming hydrogen chloride and releasing oxygen." When chlorine combines with water, no oxygen is set free, but hypo-chlorous acid is formed and this will oxidize any reducing agent in the water.

I would like to see your comments on this letter and I hope you will pardon me if I have criticised Mr. Binder's letter too strongly. I am attending Technical School and my favorite subject is chemistry, so I think I have some excuse for my criticism.

The illustrations in "our magazine" are certainly improving. The cover picture of the June magazine is excellent.

A. George Currie.
Sudbury, Ont.

(Water at "room temperatures" dissolves over twice its volume of chlorine. When chlorine decomposes water, it forms hydrochloric acid as well as hypo-chlorous acid. We think it is questionable whether the chlorine atmosphere would prevent the sun's rays from exploding a mixture of hydrogen and chlorine. You are quite right in stating that chlorine does not set oxygen free from water. We get so few letters from chemical students, that your letter is extremely welcome. Even in a romance such as Mr. Binder is describing, the science should be correct and we have a feeling that if the romance in question was gone through from end to end, it would be found to be more accurate than would appear from a resumé. If water was saturated with chlorine, and the reactions progressed, it would be able to absorb more, so it might dispose of a considerable quantity.—EDITOR.)

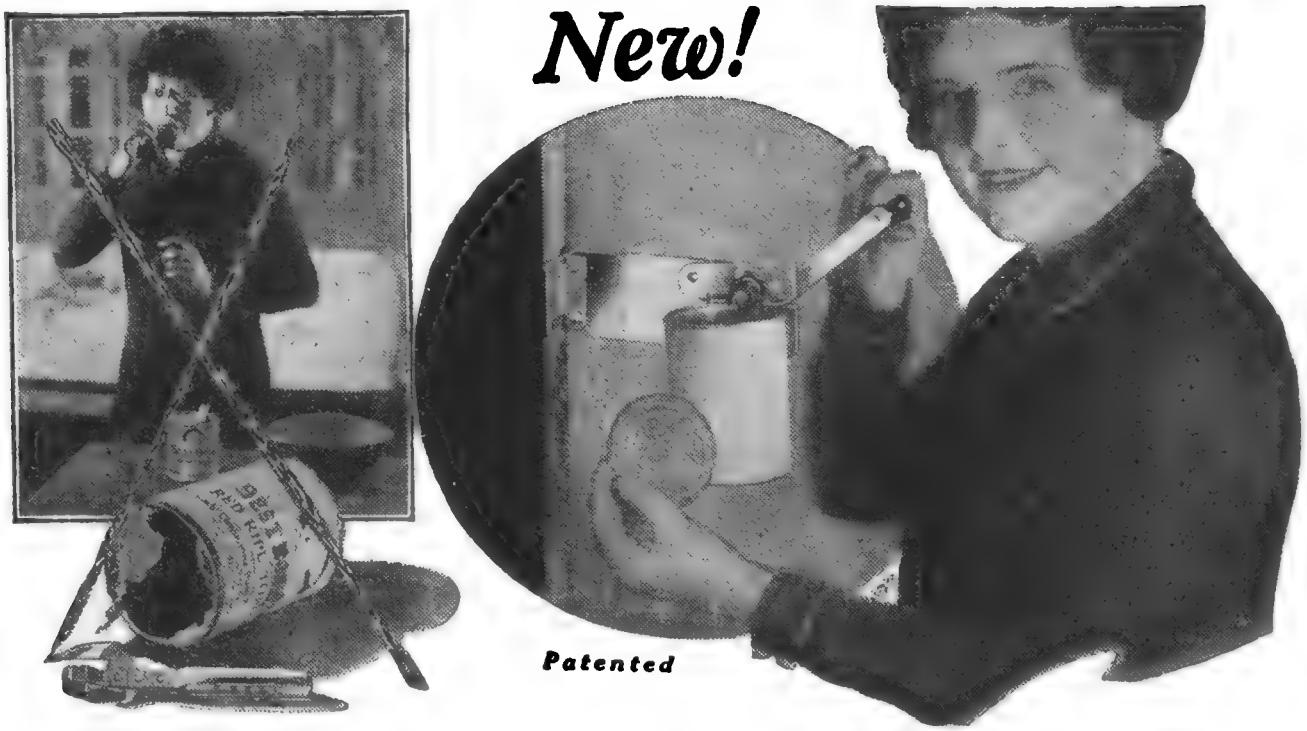
SOME REMARKS ON THE "SKYLARK THREE" AND ABOUT ERRORS. A COMPLIMENT TO DR. SMITH'S STORIES.

Editor, AMAZING STORIES:

Dr. Smith, in his foreword to "Skylark Three" mentions two errors which he made knowingly. I think I can recognize the astronomical one, at any rate.

Of course, the acceleration of twice 186,000 miles per second, as used in escaping the field of the great "dud" star, as told in "Skylark of Space" was impossible. Nothing could withstand that strain. Further, no gravitational field could be that intense. It would have exactly the effect Dr. Smith describes and allots to the zone of force in "Skylark Three"—it would make a hole in space and pull the hole in after it. Light would be too heavy to leave the planet. The effect on space would be so great as to curve it so violently as to shut it in about it like a blanket. The dud would be both invisible and unapproachable.

The astronomical error? I wonder how Dr. Smith solved the problem of three—or more—bodies? Osnome is a planet of a sun in a group of seventeen suns, is it not? The gravitational field about even two suns is so exceedingly complex that a planet could take up an orbit only



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such that one sun was at each of the two foci of the ellipse of its orbit, and then only provided the suns were of very nearly the same mass, and stationary, which in turn means they must have no attraction for each other. No, I think his complex system of seventeen suns would not be so good for planets. Celestial Mechanics won't let them stay there. And really don't see why it was necessary to have so complex a system.

Further, I wonder if Dr. Smith considered the proposition of his atmosphere plant carefully? The ammonia "cooling" plant works only to *transmit* heat, not to remove it. The heat is removed by it from the inside of an icebox for instance, and put outside, which is what is wanted. However, it must have some place to dump the heat. In the light of the Mardonallian theory, does his arenak cylinder on his compressor, and runs it very heavily, but if he can't get the heat outside the ship, and away from it, he wouldn't cool the machine at all. Since the Mardonallians kept the outside so hot, and the story says the compressor-cooling was accomplished by a water cooler which boiled—consequently was hot—I would absorb all the heat of that Mardonalian fleet in any way—and this heat was then merely transferred from outside to inside—where they DIDN'T want it!

Again, in this battle, to protect themselves against ultra-violet radiation, they gather themselves with *red* paint—presumably because red will stop ultra-violet.

Personally, I have picked some ultra-violet paint—if any were handy—as that would *reflect* the rays. Red wouldn't affect them at all, so far as I can see—he might as well have used blue. What is Dr. Smith's theory color of paint for ultra-violet, and I don't believe it is red—green is the complement of red. (Green light won't pass through red glass.)

Dr. Smith invited "knocks" with that foreword of his—I hope I am complying, as an interested reader, and a fairly constant follower, any personal opinion has always been that "Skylark of Space' was the best story of scientifiction ever printed. Since the Dunsany order I have recently changed my opinion, however, since "Skylark Three" has come out.

John W. Campbell, Jr.,
Cambridge, Mass.

(This letter from a fellow author is an excellent comment on Dr. Smith's foreword to "Skylark Three." But the writer of this letter is himself inclined to deal with and use very large quantities and high accelerations and velocities in his stories. We are going to let your knocks await a reply from Dr. Smith. The writer does not desire to find himself between the upper and lower millstones represented by an author and his critic. But you certainly have amends for your criticism by what you say about the merit of "The Skylark Stories." We hope to hear from Dr. Smith.—Editor.)

VICTORIES IN INTERPLANETARY WARS COMMENTED ON. OTHER CURIOUS ADVANCES IF SCIENCE WOULD AFFECT A TRAVELER FROM THE PAST

Editor, Amazing Stories:

This is my first letter, the first one was published by you some time ago.

I have established a little group of readers and we discuss the stories we read and get quite a kick from it. Lately I have noticed a trace of dissatisfaction among my friends and on inquiry found that they are getting "fed up." not on AMAZING stories, but on the amazing way our little planet and its great scientists always win out. For instance—we start from this Earth in a space ship, cover thousands of miles of space, meet a people of intelligence that are thousands of years ahead of us in every branch of science, social life, engineering or what have you, and no matter what happens "we win" and return in triumph. I will admit that they must win or return somehow or other to bring back the rest of the story.

The "Universe Wreckers" just published in the June issue, where, by the way, my group, The story was a good one in regards to science and adventure, but, how, how could a people, so far in advance of us and with such a grand civilization as theirs, be tricked into such rank positions as coming up through an opening in the metal roof of Neptune with their large fleet and running into such a stupid trap as having almost annihilated by our "smart" commander who suddenly stops and trains his ray beams on them as they emerge from under the metal roof. Ha. Ha. You flatter us. We are all puffed up. No wonder my club is starting to squirm; very few people can walk into a drug store and take castor oil without adding a little sarsaparilla. Don't you see you are giving us too much castor oil and it tastes bad?

I am going to try to prove my point by writing a story with not a gap of ages in the future, but with a gap of say 800 years in the past on our own Earth. I will transport the science and progress of today *back* to the 12th century and prove to you that we are not to stand a ghost of a show against our present science.

Wouldn't it also be nice if, instead of always filling our stories with the future at what progress will be made in the future, we could sit back and watch the amazement that would appear on the faces of people of the past when told where our progress is brought to bear on their then ignorance?—What have you to say?

Arthur Ostrander.
140 Henry Street,
Brooklyn, N. Y.

(This amusing letter, we think, tells its own story. It would be too bad if, in the wars between the terrestrial people and inhabitants of other planets, the Earth dwellers did not come out on top. We certainly agree with you that what we are doing today would surely astonish our predecessors, even if we only go back 30 or 40 years. So much happens in the way of technical advance and scientific achievement that we are losing the power or faculty of being astonished, and this faculty should be conserved, as it is a valuable adjunct to the scientific mind, where inspiration, in a sense, may be drawn from astonishment.—Editor.)

ERRORS IN SCIENCE FICTION, HUMOROUS STORIES. THE SCIENCE CORRESPONDENCE CLUB

Editor, Amazing Stories:

Just a few words in defense of those who pick out the scientific errors in stories.

Several correspondents have expressed their disapproval of the practice of picking out the errors, but why shouldn't they pick them out if they so desire? It may be just personal vanity on their part that makes them write in, but again what of it? If some of these mistakes are not pointed out, there might be too much of a possibility of slackness on the part of the authors and editors, and this would tend to make the stories worthless as "Science" fiction stories. We might not have had "Beyond the Green Prism," if some of the errors in the first story had not been pointed out to the author. And again, these criticisms are always written in a good spirit. Errors are made by us creep into our stories, but these critics put the authors on their guard against such mistakes.

I know the writer's agent who said that the science fiction magazines will not take humorous stories, but want something serious, for the readers of such magazines take the stories seriously. This is quite true. But, by taking these stories seriously is not meant taking the story itself and everything in it as being the truth. The majority of people who read these magazines are students of science in one way or another and generally know what is correct and what isn't, but the stories tend to make the reader think and consider the possibility (or improbability) of the new views and theories brought forth in the stories. That is why so many letters are received that point out the scientific errors. But these fellows bring out many points of interest that a casual reader might overlook, and correct erroneous ideas that others pick up.

And, such thinking has brought forth the Science Correspondence Club. So why criticize those critics?

And, a word about the Science Correspondence Club. This is an organization of scientifically inclined readers, although there are many men of the scientific world who are members. Discussion of science is carried on among the various members mainly by correspondence, but branches have been started in several of the large cities, where the members are addressed by different speakers, perform experiments, and discuss scientific subjects. Details may be obtained from Raymond Palmer, 1431 38th St., Milwaukee, Wis.

The three best authors you have are Brewer, Verrill and Campbell. Merritt does not seem to be writing for you at present, but if constant demands for his stories will bring him to AMAZING STORIES you can add my name. His stories are good. Morey and Wesso are improving.

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(We do not feel that disapproval should be expressed of those who pick out scientific errors in stories. We want our correspondents to do us this service. As the stories are distinctively romances, latitude must be given and if one, for instance, assigns an acceleration to an airship, which would be intolerable to the passengers, that should be treated as romancing for the sake of the story and not as an error. It would be fair to say that an acceleration equal to that of gravity would be about all one could comfortably stand, but even if we take three or four times such acceleration for use in a story it would be so little that it would limit greatly the scope of interplanetary tales, and these are precisely what our readers like. We highly approve of our correspondents criticizing our stories. In spite of the most careful editing, something is bound to escape notice. But impossibilities are frequently admissable to carry a story through. In the mere matter of constant velocities, for instance, a speed of 300 miles an hour, which in the cosmic sense is a mere crawl, is exceedingly trying to the crew of a racing airplane.—EDITOR.)

AN ENGLISH SCHOOLBOY READER OF INTERPLANETARY STORIES. EFFECT OF INTERPLANETARY SPACE ON THE HUMAN BODY. ROCKET PROPULSION IN A VACUUM

Editor, AMAZING STORIES:

I hope you will forgive the liberty I am taking in writing this criticism, when at the most I have only seen four of your magazines, so I am not by any means an old reader. I have been interested in scientific fiction, particularly in interplanetary stories, for some time, but seemed unable to get them, so I feel that I must tell you that I think they will meet with enthusiasm from quite a lot of the community who are interested in stories of scientific interest. But, listen, in your February number I believe a certain gentleman sent in a letter of withering sarcasm and said that half your following will be of the thrill-seeking type who read both the ghost story and detective story magazines, and have no real scientific tendencies—or words to that effect. Now in some ways, I am apt to agree with him. If you really, honestly are trying to raise the standard and level of your magazine from the general run of magazines, then you must cut out the sensational, unconvincing type of stories. I don't accuse you of publishing them. A story can be mildly sensational without being sensationally foolish. Such stories one does come upon at times. I did not care much for the illustration of Morey's in your March number, page 1161 of "Callisto at War." If you refer to it, you will notice that the molten metal from the disabled Callistonian space ships appears to drop down the page, while the moon is shown in the lower left-hand corner. Gravity would hardly let anything fall obliquely to her pull, would it? I admit that such a thing is possible here on earth with a wind blowing, but the battle is represented as taking place out in the ether where there would hardly be any conflicting currents. You could account for it by saying that the earth is supposed to be pulling too, would not the moon's pull be stronger at that distance? I find your story items very fascinating and as you say, they do open new fields of thought. I must say that I don't care for "fourth-dimension" stories, but can't anyone think of some new themes? When you've read one you seem to have read the lot. I am very interested in astronomy and found "Lanterns of God" something very new in the way of interstellar travel. But I find a big fault in a lot of interplanetary stories. The method of propulsion is usually touched upon very lightly, the touching of a lever or two apparently working the whole oracle. A very popular idea seems at present to center around propulsion by rockets. It all seems very queer. Take it this way; we have the earth, a solid body having around it an envelop of air, we are told by eminent professors, existing anywhere from 200 to 100 miles deep; outside is the black vast space of outer ether, but is it space? According to the followers of the rocket theory, should there not be something to offer resistance to the rockets or explosions? What works here on earth with the dense atmosphere to offer resistance would probably fail utterly out there in the ether. Do you follow me? If A pushes B, A himself has a tendency to be pushed backward by the force of his own push, but if B is not there to push, A may push on nothing, as hard as he likes, but he cannot move. A is the space ship, B is the air.

Your cover designs are very good, but the designer of your March cover has made the mistake of causing the vessel to break straight through the

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Pacific into the undersea atmosphere; in the story the adventurers passed through clouds of glaring red. Also on the cover, land was shown in the distance and some flying creatures in the distance, was this due to elevation? No land or birds were seen when they landed, in the story. I cannot quite think that interplanetary travel will prove a particularly easy matter as regards our own bodies. I am rather of the opinion that our bodies, born and bred and having been reared under the influence of gravitational pull, would come to pieces in space or that some other catastrophe would overcome them. I agree with you with regard to my fellow country man Mr. J. A. Strongmore's letter in your March issue. His views on the moon are unique, but the theory that we are looking upon one of the poles is obviously rather weak when subjected to a keen examination. I enjoyed reading your February number and hope you will keep up that standard.

"Vampires of the Desert," "A Baby on Neptune," the one about the Protoplasm, all of them in fact, were very good and I sincerely hope we shall soon have some more like them. I buy your magazine for three pence at Woolworth's and several of my chums are very interested in it. I'm fifteen by the way. I am sorry if I have trespassed for so long on your valuable time.

Albert P. Smith,
235 Abbeydale Rd.,
Sheffield, England

(The Editors of AMAZING STORIES always welcome criticism. They want their readers to indicate to them their desires; naturally our object is to please them. We can only judge of our readers by the letters that we receive and we think that the tone of their letters shows that they are thinkers, that they are not of the thrill-seeking type. If you will go through the Discussions Columns, we think that you will agree with us in our judgment of the standard of our readers—they certainly think. We have tried a number of artists in the years past and of all of them, we put Morey, Wesso, Paul and one or two others in the front rank. Your criticism of the picture is valid enough; the obliquity of the fall would depend on the distance of the moon, on the distance of the earth and would perhaps be influenced perceptibly by the sun. It is hard to say what will be the up-shot of "fourth-dimensional" stories, to which you object, but we do not feel that our authors should be stopped from this topic, which has proved congenial to so many. As regards propulsion in the vacuum of outer space, reaction, such as that embodied in the rocket, seems to be the only possible solution of the problem presented. Like a great many others you are totally wrong in the idea of the operation of a rocket. As the rocket expels gas in one direction, the reaction drives it in the other direction, and it will work far better in an absolute vacuum than in the air. The air only operates to retard its motion. You should study Newton's law. It is strange how often we have had to correct this error. Gravitation plays a minor part within our bodies. If a man were removed from the influence of gravitation, he certainly would not come to pieces. It seems probable that he would be in a more favorable condition than if he were hanging head downwards and that certainly does not trouble gymnasts.—EDITOR.)

MORE ABOUT DR. BREUER, WITH SOME REMARKS ON THE "GOSTAK AND THE DOSHES"

Editor, AMAZING STORIES:

I cannot offer any long subscription or vast knowledge of science as an inducement to have this letter printed, but I can say this! AMAZING STORIES is the first magazine I have ever written to.

The reason I am writing this letter is evident when I mention "The Gostak and the Doshes." This is a little late to praise the story, but I had to read it twice to get the theme of it fully in mind. I may only be a high school student, but I know a real story when I read one. The main reason for its popularity, I think, is its unique plot and the very idiotic expression.

To me it seems strange that there is not more discussion about the article to the front. I read it first. It is the truest statement in the magazine.

There is now much discussion about serials and short stories and I wish to put in my vote. It is this: AMAZING STORIES is bound to succeed because it gives what the youth of today demands —improbability (notice I do not say impossibility) in the form of science; therefore A. S. does not need an added inducement to insure regular sales. I think this is more reason than some advocates

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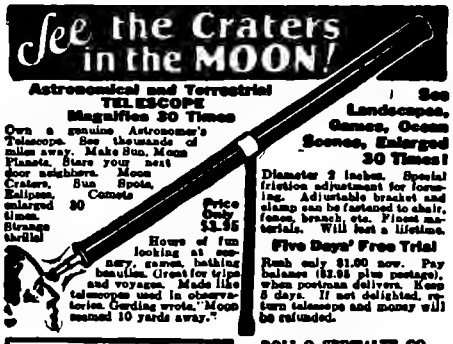

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OUR "ULTRAMODERN" MAGAZINE. AN INTERESTING LETTER FROM ENGLAND.

Editor, AMAZING STORIES:

Until I became introduced to your ultra-modern magazine some time ago, my choice of magazine was confined to "Ghost Stories" and the "Wide World" magazines. The majority of your popular magazines indulge in an orgy of Transatlantic phraseology which is rather nauseating to the average Britisher. There is no doubt that, since the World War and the advent of the motion pictures, our language is becoming rather less conservative than in the past, but there is no reason why it should be allowed to degenerate into an ugly sounding gibberish.

Your magazine strives to keep far above the average literary standard, without becoming, in spite of the scientific nature of its contents, too "high-brow" and ponderous.

By all means retain the sentimental appeal in your stories. We may depend upon you not to overdo this by coating the pill of science too thickly with the sugar of sentimentality. Applied in the form of seasoning, romance will serve its purpose by leavening the lump. Pardon my mixture of metaphors.

The original title must remain. AMAZING STORIES acts like a magnet to the mind in search of clean and sensational literature. The very mention of the name of *Science* spells stodgy drudgery to the average human being, even in this scientific age. "Amazing Stories of Scientifiction" is a good cover title. With regard to "Scientifiction," there is nothing cheap and nasty about this type of story. It is essentially a class of literature which might appeal, according to the particular viewpoint, to almost anybody. And what a treasure-chest of scientific lore is AMAZING STORIES for the earnest student, and what a wonderland of romance does it open up to the lighter-minded reader.

When such world-famous writers as Jules Verne, Conan Doyle, H. G. Wells and Edgar Allan Poe have added to the ever increasing store of "Scientifiction," who then would dare to offer adverse criticism?

"*Chacun à son gout,*" of course, but recently the number of the shorter stories has become irritatingly preponderant. It is my contention that no really worth-while scientific story can be written within a certain number of words. I may substantiate my statement by reference to your January 1930 issue. The stories of outstanding merit, appear to me to be:

(1) The Fourth Dimensional Space Penetrator
(2) Beyond the Green Prism
(3) When the Atoms Failed

The above were absorbingly interesting, compelling well attention throughout, and the briefer stories were far below previous standard and rather weak in phraseology, particularly "Air Lines" and "The Corpse that Lived." The "Hungry Guinea-Pig" was rather different from the ordinary run of stories, and was thoroughly enjoyable.

Sound criticism is of primary importance in any venture and the more sound the criticism, the more valuable. Constructive criticism exists up to a certain point beyond that it becomes destructive. Your discussions department must prove a valuable asset; in fact your idea appears to be to make of every reader an active member of your staff. But there are, in my opinion, far too many brickbats aimed unnecessarily at the editorial heads. Some readers complain of impossible situations and fantastic developments, others complain because of unappeasable appetites unsatisfied. A certain section of your public appears to devote itself exclusively, like a self-appointed board of critics, to finding faults and searching for factual discrepancies. Like the "man with the muck-rake" in Bunyan's "Pilgrim's Progress." How they must spoil their own enjoyment of the stories, which were written primarily to entertain and then to instruct! If these critics would assimilate the fundamental wisdom of taking things "*cum grano salis,*" they would not desire to confine the writers' creative imagination between certain prescribed bounds. If I have been indulging in "hard hitting" tactics, I can only hope that the victims may accept my tirade in a sportsmanlike manner, and endeavor to prove to my satisfaction that this attack is unjustified.

One little suggestion, Mr. Editor. In view of the genuine enthusiasm shown by your readers for their favorite magazine, I would suggest that with your Quarterly numbers you should issue a colored supplementary illustration, which would be worthy of framing, thus acting as a continual reminder of your wonderful publication.

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A further comment upon your "Discussions" department. One of the most amazing features of your most amazing magazine is the way in which you have set yourself up as an intellectual "Aunt Sally," accepting brickbats and bouquets impartially. You have never been afraid of publishing these brickbats, realizing, doubtless, that they are offered in the spirit which "all the fun of the fair" imbues. There exists a genuine bond of sympathy between your official and your "unofficial" staff, and it is evident that every member of both parties is out to help our magazine on to ultimate perfection.

Your covers are becoming artistic masterpieces, and the general verdict upon the size, binding and illustrations appears to be favorable. With regard to the illustrations, I sincerely regret the loss of Artist Paul. It is my firm conviction that, as an illustrator of science fiction stories, Paul is unparalleled. You have certainly secured two splendid artists in Wesso and Morey, whose drawings are showing improvements. Why not give us some brush drawings?

Although I should much prefer new and original stories, yet there must be several which have been already published and which would be well worth reprinting in your pages. One of these I should like to see published in "Amazing Stories" is entitled "The Night Land." This deals with the battle between the last million survivors upon this earth and a whole army of elemental forces. It is entrancingly romantic and is guaranteed to hold the reader spellbound by the charm of its description. Truly an amazing scientifiction story, which would prove well worth reprinting.

Yet another suggestion. An original theme for a "scientifiction" story has occurred to me. Why not get Dr. Breuer to write a story around the idea of a fourth dimensional means of solving the rather difficult problem, with which many of us are faced at times, of being in two places at one and the same time. The idea certainly has its humorous possibilities.

Your March number and the Winter Quarterly were well up to expectations. The stories which gained my deepest interest were the following:

(1) White Lily—Truly a novel of surpassing interest. It is written with a touch of refreshing humor by an author from whom much may be expected. Although at times departing from the lines of strict scientifiction, it assuredly deserves the place of a classic.

(2) Tani of Ekkis—Certainly a well-written story full of amazing situations.

(3) The Lanterns of God—A fantastic and colorful story of enthralling interest.

(4) Dirigibles of Death—Mr. Verrill lives up to his reputation as a writer of absorbing scientifiction.

(5) The Astounding Enemy—Although not a lover of this type of fiction, I must acknowledge my indebtedness to the authors for an exceedingly remarkable tale.

(6) The Green Girl—Amazing adventures we should all, I am sure, like to share with Mel and Sam.

(7) The Ship that Turned Aside—Weird and wonderful, with an unexpected ending.

All the remaining stories were worthy of inclusion in your (or should it be "our") magazine.

I could not imagine anybody once becoming an enthusiastic reader of Amazing Stories ever wishing to return to the insipid anæmic trash which passes for literature with so many. Amazing Stories certainly deserves wider recognition and deeper consideration and long life.

Accept my sincerest gratitude for having deeply interested a rather apathetic phlegmatic individual.

May Amazing Stories find its way on every bookstall over here and become as well known as it truly deserves.

George M. Simpson,
11 Rendle St.,
Kensington,
London, W 10, England

(We always enjoy comments and criticisms from England. Our endeavor is to avoid the things you object to in the first paragraph of your letter. We can only say that our magazine receives editing enough to keep it on a plane of good English. But, of course, a favorable criticism from the British Isle means a good deal to us. You speak of coating the pill of science with sugar; we are trying to put the science in such shape that it will not be a pill and will require no coating. Your knowledge of fermentation leads you to the right conclusion concerning your mixed metaphor. For long stories, we would suggest the quarterly Amazing Stories, but we receive some extremely good stories which we cannot well reject and as luck has it sometimes,

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9 Digestive System
10 Male Organs in Detail
11 Female Organs in Detail
12 Process of Pregnant Female Body with Child

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the short ones will accumulate in one issue, but we think you will find perhaps more good matter in short stories than in the long ones *pro rata*. "The Hungry Guinea-Pig" which you enjoyed is by one of our most esteemed authors. You are very kind in what you say about brickbats aimed unnecessarily at the editorial heads. As a matter of self-respect we rather encourage brickbats and the editorial heads are thick enough to stand the impact of that weapon of our critics. And now you are receiving some bouquets at the heads of our critics. Your suggestion for the Quarterly is a very nice one. We believe that you are too good a sport if you were in our place, you would stand the bombardment due to an "intellectual Aunt Sally" just as we do. But we are better off than "Aunt Sally." She gets no bouquets. We have not lost Artist Paul, though we still think that the work of Wesso and Morey is in the same grade of that of Paul. However, it is a great point to have several artists. We have found that it is a good policy for us not to give too many reprints. Some years ago we gave a number, all by good authors, but they were not very well received. We are very glad to receive a missive from Kensington, sacred to the memory of Peter Pan, the hero of Barrie's charming stories. There is a prevalent idea that an Englishman is hard to please. We are very glad to be able to say that some of our nicest letters come from England.—EDITOR.)

SOME WORDS OF APPRECIATION. THE QUESTIONNAIRE

Editor, AMAZING STORIES:

Your cover on the May issue is the best one I've seen on your magazine ("our" magazine!) in a good while. I have just taken a glance through "our" magazine and I am glad to see you are inaugurating the discussion system again. But please don't have the coupon on one side of a page with part of a story or discussions on the other. Probably that is why so few readers send their coupons in. (As in the August issue.)

As I have never read the "Skylark of Space," may I suggest something in behalf of myself and other readers who have not read same? Before you publish "Skylark Three," sequel to "Skylark of Space," why not publish "The Skylark of Space" in booklet form for the benefit of those who have not read it and also for those who would like to have it in booklet form?

Your questionnaire certainly helps one. On this last biology examination, I was able to answer three questions due to your questionnaire. In fact, that is what started me writing to you. The questions seem to be getting harder with each issue, but keep it up, if I can't answer them, I read the stories later and find out. But the questions certainly are helpful, keep them up.

Please excuse my sarcastic way of putting the following: Have any of the following authors been killed, injured, struck by lightning, or what? A. Merritt, Murray Leinster, Ray Cummings, A. I. Burks, Victor Rosseau and R. F. Starzl. I know you have a story by R. F. Starzl in the May issue, but I would like to see him more often. But how about the rest? I have heard that A. Merritt is finishing the sequel to the "Face In the Abyss." Is that so? As I keep up with "Argosy," I know that Ray Cummings and Murray Leinster are still writing for them. By the way, why not publish "Princess of the Atom" by Ray Cummings, which began in September 19, 1929 "Argosy" and ended in October, 1929? Do we get the sequel to "The Face in the Abyss" or does "Argosy" get it first? I hope we get it.

While I am on sequels, when do we get a sequel to "The Moon Pool," "The Ship of Ishtar"? Victor could write a good sequel to "Callisto at War," you know we haven't gone to Mars or Venus yet, so let's go! How about a sequel to the "Dimension Segregator?"

Now as to booklets. Instead of reprinting such stories as "The Moon Pool," "The Face in the Abyss" and others besides these, which I have not read, why not put them into booklet form? I am sure a sure sale would result in sales.

Do not change the name. Instead, put out another magazine devoted to the same type of stories as those in AMAZING STORIES.

Keep up the choice coupon idea. You have started it again in the May issue. I am not enclosing the May issue coupon, for I wish to wait till I have all three parts to the "Universe Wreckers." I am enclosing the coupons which you have put in your magazine from the August issue to the May. I did not like to cut out the coupon in the August issue because of what was on the other side, so please do not put in any more such important questions. I am sure if you called the readers' notice to the coupon, by a

little paragraph put here and there, that they would send their coupons in.

My next subject is your authors. Mr. Vincent is my favorite by far. His stories, "Mierocosmic Buccaneers," "Barton's Island," "The Celestial Nemesis," "The Explorers of Callisto" and "Callisto at War" were all excellent. And also "Venus Liberated" in the Quarterly. I have never yet been disappointed in Mr. Vincent's stories and never expect to be. I hope you will have much more by him in the future.

I do not like Mr. Verrill's stories on archaeology, such as: "The Bridge of Light," "Into the Green Prism," "Beyond the Green Prism" and "The Feathered Detective." He is far better on such stories as "Death from the Skies," which was very well written.

Dr. Keller is no good at stories such as "The Twentieth Century Humunculus," "White Collars," "Euthanasia Limited" and "Air Lines." Also keep him off the "bug" stories, before he gives me bugs. "The Fury War" was a distinct improvement on his usual work. Please tell him so. Also the method of destroying the ivy was not unnatural but well thought out and the plot of the story is excellently put together.

Miss Stone is also very good, but I did not like the form which she used in "Out of the Void," instead of telling it she should have put in an "active" form. In other words, instead of having it told from a third person point of view as an actual part of the story. "Through the Veil" in the latest issue is very good.

"The Gilmlet" was absolutely rotten, plain rotten; it does not belong in a fiction magazine. Just a lot of technical gib-gab, no interest for the reader, no action but just talk and no adventure. I have read another story by the same author and it was just as bad, so please do not publish any more stories by him. In fact, I am surprised that you published "The Gilmlet," since we are so good when they are too technical and have no action. Excuse the words I use in reference to "The Gimlet," but that is just the way I feel about it.

Mr. Williamson was wonderful in the way he handled "The Green Girl." That story was a wow! It certainly kept one's interest from beginning to end. And especially the way it began, I should say I would like to see more from Mr. Williamson.

Edmond Hamilton is excellent except for one thing and that is, his plots in the different stories he writes are always the same. He would be much better if he could change his plots. It is always this: a great catastrophe faces everybody, ah! the inevitable "I" is always saved and spends never heard of before, "I" do things almost impossible and in the end either "I" or someone else stops the thing that is about to destroy mankind. And it looks to me as though "The Universe Wreckers" is due to turn out the same way. If it does, there's no telling what I might do.

I believe I have taken enough of your time, so I will sign off in hopes that you will agree with my booklet idea. Pardon me, not mine but everybody's.

Don't forget about those writers I mentioned. If I am not mistaken, other readers besides myself would like to hear from them.

G. Kirschner,
Box 867,
Sumter, S. C.

(We are very much pleased to get all your suggestions. But the unfortunate part of it is, Editor's life is that he has to deal with suggestions from so many readers and in so many cases absolutely contradictory that he does not know what to do about it. We wish you could see the number of excellent stories which we have on hand awaiting publication. It makes us feel sometimes that ("our" meaning the world, Mr. Verrill is a very distinguished ethnologist and archaeologist and so down the line. Dr. Breuer is a distinguished diagnostician and Dr. Keller, a most delightful writer in our humble opinion, is a high authority on psychopathy. He has received some extraordinary public compliments on his ability as a writer. We are inclined to disagree with your views of "The Gimlet" which impressed us as an extremely good bit of romancing. Even if our views do not coincide with yours in all respects, we are delighted to hear from you and hope to get more letters from you in the future. We want to feel that our readers, in a sense, are on our editorial staff.—EDITOR.)

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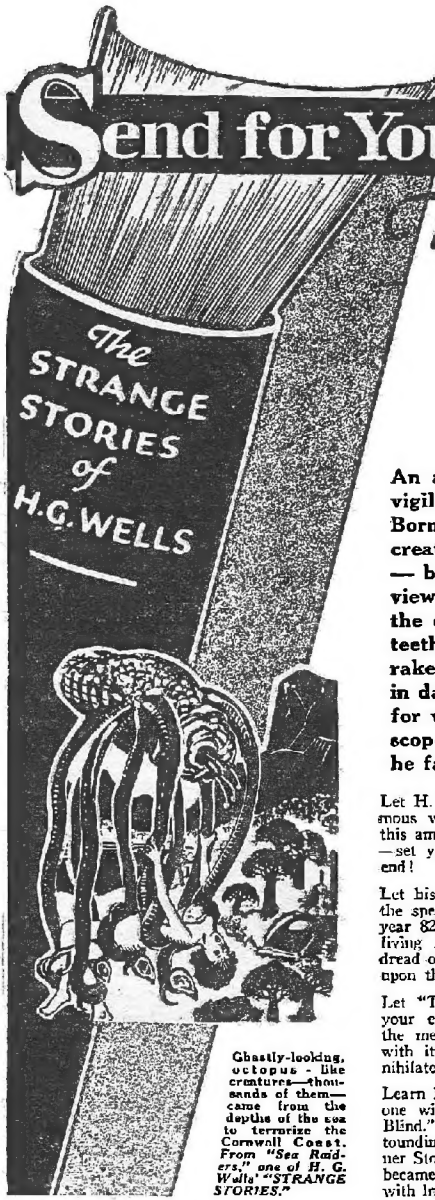

Ghastly-looking, octopus - like creatures—thousands of them—came from the depths of the sea to terrorize the Cornwall Coast. *From "Sea Raiders," one of H. G. Wells' "STRANGE STORIES."*

An astronomer on a lonely vigil in a dark observatory in Borneo. . . . A monstrous creature—bird, bat or devil — blots the stars from view. . . . It smashes through the dome-roof. . . . Sharp teeth bite and tear, claws rake his face. . . . He fights in darkness, a broken bottle for weapon. . . . The telescope sways, the room reels, he falls. . . .

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Learn how dreadful it is to be the only one with eyes "In the Country of the Blind." Laugh with Wells in the astounding chemical mystery of "The Plattner Story." Read how a huge DYNAMO became the God of a pagan religion with human martyr and human sacrifice!

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Here are the fantastic fabrications that brought Wells overwhelming fame. Here are thoughts no mortal ever dared to think before. Here are stories so bizarre, so weird, so gruesomely real that only people with nerves of steel can read some of them after dark!

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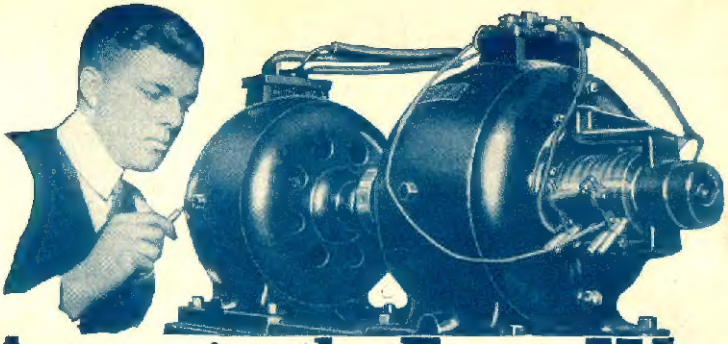

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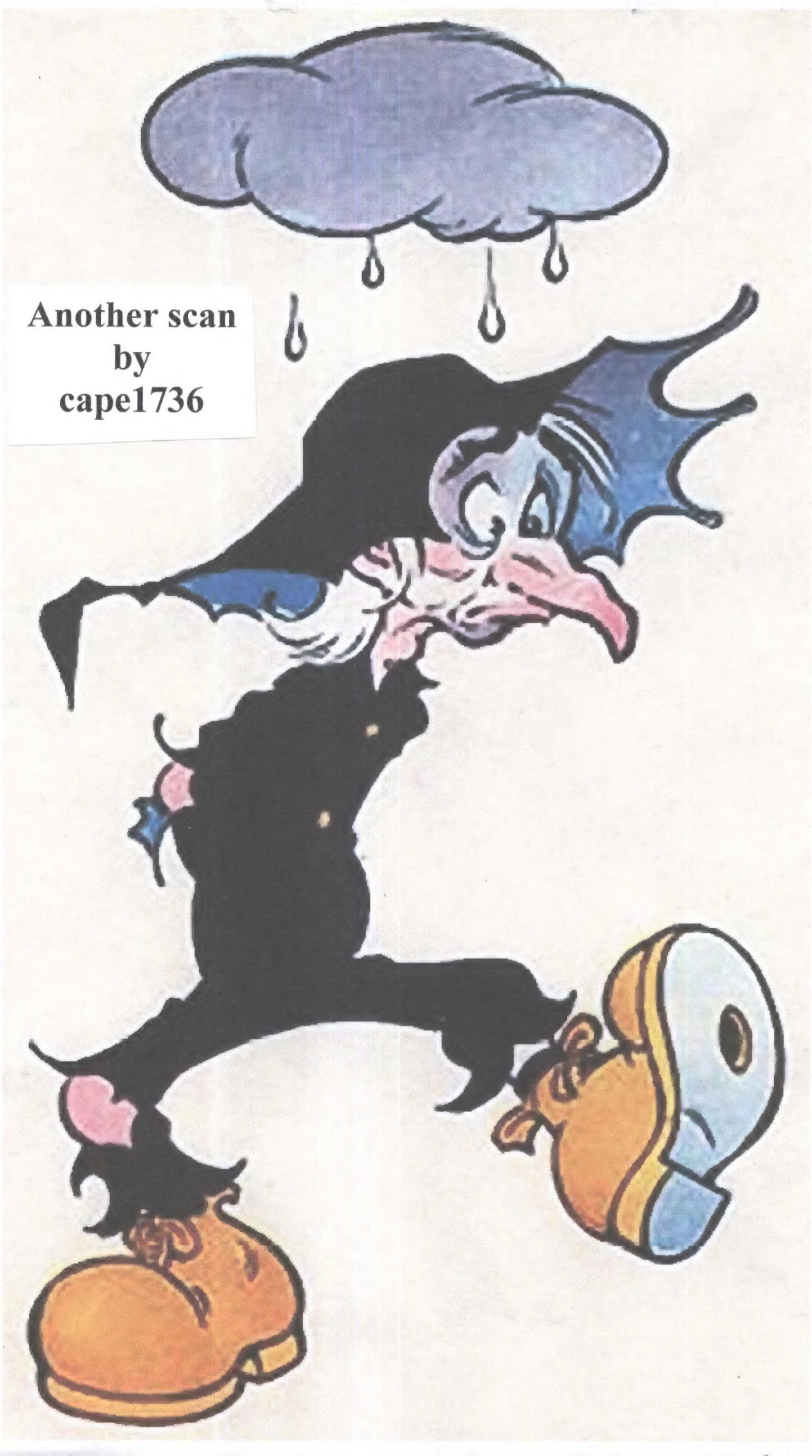
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